

Agri About

www.agriabout.com

Sustainable agriculture for the future

March | Maart 2026

No 155

Youth in Agriculture

Innovation and Opportunities

Training for Tomorrow

Innovation in Action

Start small – grow persistently

Irrigation training at schools

Underutilized indigenous crops

Boosting Dry Anaerobic Digestion

Making Craft-Style Tomato Chutney

Weather Risk App

The Trusted Home of Agriculture
Die Betroubare Tuiste van Landbou



SERVICE EXCELLENCE

At BKB we value the importance of trust. Trusting that the rains will return and that the land will produce for those who nurture it. Knowing that trust cannot be bought, but rather earned over time through our actions and our commitment to you, through the good times and bad. We take pride in the relationships we have built with generations of clients, each underpinned by integrity and bound through a look in the eye and the shake of a hand.

WWW.BKB.CO.ZA



The Trusted Home of Agriculture
Die Betroubare Tuiste van Landbou



To scan, download
a free QR Code app

#SustainabilitySynergised

PEOPLE | PLANET | PROFIT

SERVICE EXCELLENCE | ENTREPRENEURSHIP | EARNINGS | EMPLOYEES | SUSTAINABILITY

#IntegrityIntegrated



Editorial

This month AgriAbout shines a spotlight on the future of farming. Under the theme *Youth in Agriculture: Innovation and Opportunity*, we explore how young people are reshaping the sector with energy, creativity, and resilience.

Across this edition, you'll find stories that highlight the diverse ways youth are engaging in agriculture. From training initiatives that prepare tomorrow's farmers, to irrigation programs in schools that equip learners with vital water management skills, the seeds of innovation are being planted early. We also share the inspiring journey of a young Zimbabwean farmer who proves that persistence and steady growth can build lasting success.

Innovation is not limited to technology - it extends across the value chain. Articles on precision irrigation, hydroponics, and shared

responsibility in water efficiency remind us that sustainability is a collective effort. At the same time, policy discussions around cannabis and hemp, with studies pointing to a R40 billion potential for industrialisation, show how new opportunities are emerging in South Africa's agricultural landscape.

We also bring you insights into agroecology, underutilised crops, and the role of small millers in rural districts - each a reminder that agriculture thrives on diversity and collaboration. Tools like weather risk apps demonstrate how digital solutions are helping farmers adapt to climate challenges, while rooibos growers continue to navigate pressures of trade and environment.

The youth of today are not simply waiting to inherit agriculture; they are already leading, innovating, and proving that farming is a dynamic, evolving sector full of possibility.

Their stories inspire us to support and nurture this generation, ensuring that the future of agriculture is both sustainable and inclusive.

We invite you to read, reflect, and engage with this edition. Together, let's continue planting the seeds of opportunity- in our soil, our communities, and our youth.

Until next time.

Chris



If you are not a subscriber yet, please subscribe now by using the button.



Please share with your friends and colleagues

In this issue

In hierdie uitgawe

- 6 Youth in Agriculture: Innovation and Opportunities Across the Value Chain
- 8 Training for Tomorrow: Pathways for Young Farmers
- 9 Innovation in Action: How Young South Africans Are Transforming Farming
- 10 Start small – grow persistently: The story of a young farmer in Zimbabwe
- 16 Turning Irrigation Efficiency into a Shared Responsibility
- 18 Precision Irrigation: A Component of Precision Agriculture
- 21 Hydroponics for Sustainable Agriculture
- 24 Weather Risk App: A new online tool to help South African farmers manage weather risks
- 30 Rooibos Maintains Course Amid Climate and Trade Pressures
- 33 Cannabis and Hemp's slow journey of policy formulation in South Africa
- 34 Study finds R40 billion potential for hemp industrialisation in South Africa
- 38 South African agriculture exports reach post-Covid peak, driven by market diversification
- 40 Agroecology Farmers Awareness Day: Putting legislation and policy into practice
- 43 Agriculture anchors the national economy with 17.4% growth
- 44 Underutilized indigenous crops: Lessons from Mkolorha Village in Mbizana
- 48 Boosting Dry Anaerobic Digestion with Size-Reduced Biochar
- 50 The Role of Small Millers in Rural Vhembe District, Limpopo
- 52 Foot And Mouth Disease Update: Western Cape
- 54 Making Craft-Style Tomato Chutney
- 56 Butter Roasted Flattie with Roasted Shallots
- 58 Spicy Savoury Rice

Menings van medewerkers, en adverteerders word nie noodwendig deur AgriAbout onderskryf nie. Alle artikels, foto's en inligting hierin vervat behoort aan AgriAbout en mag nie sonder toestemming herdruk of gebruik word nie.



Contributors

Medewerkers

John MacRobert

Felix Reinders Pr Eng: FSABI, South African Irrigation Institute

Macdex Mutema, ARC-Natural Resources & Engineering

Milcah Matjeke, Tsietso Khajoane, Salome Lebelo, Moremi Makgoka, Mariette Truter: Agricultural Research Council

Dr Sarah Roffe: Agrometeorology Division, ARC – Natural Resources and Engineering

Wandile Sihlobo

JS Kau, S Walker, JJ Anderson, W Shiba, TJ Mboweni, L Maboa & M Matlou: ARC

Ayabonga Toko, Dr Anele Mayekiso, Professor Michael Aliber: University of Fort Hare, Department of Agricultural Economics

Dr Ashira Roopnarain and Dr Haripriya Rama: ARC-Natural Resources and Engineering

Livhuwani Masola: Agricultural Research Council

Theresa Siebert: ARC-Natural Resources And Engineering

Ina Paarman

To contribute or to advertise

Om by te dra of om te adverteer

Chris Kriel

Editor

chris@agriabout.com

082 788 2467

Opinions of contributors and advertisers are not necessarily those of AgriAbout.

All articles, photos and information contained herein belongs to AgriAbout and may not be reprinted or used without permission.



Youth in Agriculture: Innovation and Opportunities Across the Value Chain

South Africa's agricultural sector is entering a decisive moment. The average age of farmers continues to rise, while younger generations often view farming as inaccessible or unattractive. Yet the future of food security, rural employment, and innovation depends on youth entering and reshaping the sector. If South Africa is to build resilient and climate-smart food systems, it must harness the creativity, energy, and entrepreneurial spirit of its young people.

Beyond the Farm Gate

Agriculture today is far more than planting and harvesting. Young South Africans are finding opportunities across the entire value chain. Agro-processing enterprises are adding value to raw produce, turning maize into packaged snacks or fruit into export-ready juices. Logistics companies are innovating with cold storage and distribution networks that connect rural producers to urban markets.

In finance, young professionals are designing products tailored to smallholder farmers, while agritech startups are building mobile apps, drone services, and digital marketplaces. Marketing and e-commerce platforms are enabling youth to connect farmers directly to consumers, creating new revenue streams and reshaping how food reaches households.

These opportunities demonstrate that agriculture is not only about growing crops. It is about building businesses, creating jobs, and driving innovation across the economy.

Innovation as a Driver

Across Africa, digital advisory services have shown their potential. In East Africa, mobile-based agronomy platforms have helped farmers increase yields significantly. South Africa, with its strong mobile penetration and growing agritech ecosystem, is well positioned to replicate these successes.

Innovations such as hydroponics, aquaponics, regenerative farming, drone technology, and mobile apps are already being adopted by young South Africans. These practices reduce environmental impact, conserve water, and open new markets. They also make agriculture more appealing to youth who see farming not only as a livelihood but as a business opportunity.

Training and Support

Education and training remain the backbone of generational renewal. Programmes such as **AgriSETA Learnerships and bursaries** are opening doors for unemployed youth, providing accredited pathways into farming and agribusiness. The **Future Farmers Foundation** offers mentorship and international internships, while initiatives like **Afrika Tikkun's Agripreneurship Programme** combine technical training with business skills to prepare youth for diverse opportunities.

These initiatives not only equip youth with technical skills but also foster entrepreneurship, leadership, and resilience. By investing in training, South Africa

ensures that its next generation of farmers, agripreneurs, and professionals is ready to meet the challenges of food security and climate change.

Opportunities and Employment

Recent labour data shows that agriculture helped boost employment in 2025, with farm jobs reaching their highest level since 2023. Stats SA reports that agriculture was a key driver of GDP growth in Q4 2024 and Q1 2025, contributing to overall employment gains. At the same time, youth unemployment remains alarmingly high, with **over 10 million young South Africans aged 15–24 facing the highest barriers to entry**. Agriculture, with its diverse value chain, offers one of the most promising avenues for youth employment and entrepreneurship.

The Urgency of Delivery

The challenge is not vision but execution. Too many promising strategies remain stuck at the pilot stage. A recent report by **Boston Consulting Group and Precision Development** highlights the need for Digital Agriculture Units (DAUs) — specialized government teams that coordinate

investment, align incentives, and ensure delivery.

For South Africa, DAUs could anchor digital agriculture within national policy while working together with provinces, agribusinesses, and farmer associations. Without this delivery capacity, digital agriculture risks remaining a buzzword rather than a reality.

Conclusion

South Africa's agricultural future depends on its ability to embrace digital transformation and youth innovation. By embedding delivery capacity into national systems and scaling climate-smart practices, the country can build food systems that are resilient, inclusive, and sustainable.

Youth are not only the future of farming — they are the present. Their innovation, energy, and entrepreneurial drive will determine whether South Africa can secure its food systems in a climate-challenged world. The next big harvest will not just come from the soil; it will come from data, ideas, and the determination of young farmers, agripreneurs, and professionals across the agricultural value chain.



Training for Tomorrow: Pathways for Young Farmers

Generational renewal in South Africa's agriculture depends not only on innovation but also on education and training. For young people to succeed in farming and agribusiness, they need access to skills, mentorship, and structured opportunities.

AgriSETA and Skills Development

AgriSETA plays a central role in agricultural training. Through accredited courses and partnerships with colleges and training providers, it supports skills development in areas ranging from crop production to agribusiness management.

Future Farmers Foundation

The Future Farmers Foundation provides mentorship and international internships for young South Africans. Participants gain hands-on experience on farms abroad, learning new techniques and approaches that they can bring back home.

Afrika Tikkun Agripreneurship Programme

Afrika Tikkun has launched an agripreneurship programme that combines technical training with business skills and social support. Targeting youth aged 19–35, it positions agriculture as a launchpad for change.

Hand in Hand Southern Africa

Hand in Hand Southern Africa offers agripreneurship training focused on sustainable farming practices and business development. By equipping youth with both technical and entrepreneurial skills, it enables them to create profitable ventures.

Conclusion

Training is the foundation of opportunity. By investing in skills development, mentorship, and education, South Africa is equipping its youth to lead the agricultural sector into the future.



Innovation in Action:

How Young South Africans Are Transforming Farming



Innovation is reshaping agriculture, and young South Africans are at the forefront of this transformation. Their willingness to embrace new technologies and business models is redefining farming and agribusiness, making the sector more resilient, efficient, and attractive to the next generation.

Hydroponics and Aquaponics

Hydroponic and aquaponic systems are gaining traction among youth-led enterprises. These methods allow crops to be grown with minimal water and without soil, making them ideal for urban and peri-urban environments. Young entrepreneurs are establishing small-scale hydroponic farms that supply fresh vegetables to local markets, restaurants, and retailers.

Drone Technology and Precision Farming

Drones are increasingly used for crop monitoring, pest detection, and precision spraying. Young farmers and agritech startups are leading the adoption of these tools, which reduce costs and improve yields. By integrating drone data with mobile applications, farmers can make informed decisions about irrigation, fertilization, and pest control.

Mobile Apps and Digital Marketplaces

Mobile penetration in South Africa provides fertile ground for digital agriculture. Young innovators are developing apps that connect farmers directly to consumers, bypassing intermediaries and improving profitability. These platforms also provide advisory services, weather forecasts, and market price updates, empowering farmers with real-time information.

Regenerative and Climate-Smart Practices

Young farmers are also embracing regenerative agriculture, which focuses on soil health, biodiversity, and carbon sequestration. Practices such as conservation tillage, crop rotation, and integrated pest management are being adopted to build resilience against climate change.

Conclusion

Innovation is not a distant concept; it is already being implemented by young South Africans across the agricultural landscape. From hydroponics to mobile apps, youth are proving that farming can be modern, profitable, and sustainable.

Start small – grow persistently: The story of a young farmer in Zimbabwe

John MacRobert

Ashton Chimukosi is a 30-year-old married man with one child, who has been progressing in his farming business since graduating from university in 2019. I had the pleasure of visiting with Ashton earlier this year and was impressed with his farming enterprise. Here is an interview I had with Ashton.

Tell us about your journey to become a farmer

I grew up in a farming environment, which sparked my early interest in agriculture. This passion led me to study Crop Science at the University of Zimbabwe, where I gained technical knowledge in crop production and farm management. I started farming on a very small scale with a simple vegetable garden and gradually expanded as I gained experience and confidence. Over time, the operation has grown into a diversified horticultural enterprise.

Describe your farming operation – where you are, your soils, infrastructure, irrigation, cropping programme, etc.

My farming operation is based in Goromonzi Zimbabwe, about 30 km northeast of Harare, on fertile red soils that are well suited for horticultural production. We initially obtained by lease 6 ha but have expanded to 18 ha by leasing more surrounding land. The main crop is potatoes, supported by other crops

such as green mealies, beans, and vegetables like cabbage and onions grown at different times of the year. The farm is well equipped with a tractor and a full set of implements, a borehole, a large water storage tank, and a storage shed for produce and inputs that



I have accumulated over the years as my enterprise has prospered. I work with a team of trained farm workers who help ensure that operations run efficiently throughout the season.

What is your vision for your farm and how do you see the way to progress towards your vision?

My vision is to develop the farm into a strong and sustainable commercial farming enterprise. I plan to achieve this by expanding production, improving efficiency, and installing a pivot irrigation system to support large-scale cropping. Another important goal is to bring surrounding idle farms into production by renting them and putting the land to productive use. Through expansion and improved irrigation, I aim to significantly increase output and create a more resilient farming business.

How do you manage your farm finances?

The farm has grown gradually through reinvesting income generated from crop production. I started very small with vegetable production, and the profits were used to expand the operation step by step. Over time this allowed investment in infrastructure, equipment, and larger cropping programmes. Today the farm is largely self-sustaining, with production income supporting ongoing operations and further growth. My brother helps me on the financial accounting and management.

What are the obstacles and hurdles you face in achieving your farming goals?

The main challenges I face are access to capital and the effects of climate change.

Expanding production and investing in modern irrigation systems require significant financial resources. Climate variability also affects planting schedules and crop yields. Managing these challenges requires careful planning and adapting farming practices where necessary. The high costs of inputs is another great challenge to our production, not also forgetting the high cost of electricity that is used for irrigation.

What support services do you use and what services would make your farming more successful?

The farm benefits from agricultural input suppliers, technical advice, and market networks that support both production and marketing. Skilled farm workers also play an important role in maintaining productivity and crop quality. However, improved access to agricultural financing would greatly help farmers expand their operations. Support for modern irrigation technologies would also strengthen resilience against changing climate conditions.

What advice would you give to aspiring young farmers?

My advice to aspiring young farmers is to start small and grow steadily while building experience and knowledge. Farming requires patience, discipline, and a willingness to learn continuously. It is important to focus on good farming practices and quality production from the beginning. With dedication and proper planning, agriculture can grow into a successful and rewarding business.



Irrigation training at schools:

Investing in South Africa's youth

Felix Reinders Pr Eng

FSABI

South African Irrigation Institute

Irrigation training presents a prime opportunity to expand the knowledge base of school learners to empower them and opens them to understanding the principles in irrigation and how things grow, live and die. Starting irrigation training at a young age helps learners to get perspective on their lives and the world around them.

In a Water Research Commission (WRC) funded project, entitled "Irrigation training for agricultural schools", the South African Irrigation Institute (SABI) conducts irrigation training at high schools on a nationwide basis. The objective is to capacitate learners and educate them to understand the process of efficient irrigation water use and management with the use of irrigation systems. By focusing on schools, SABI believe that the training received will spark an interest in irrigation amongst our youth.

Knowledge is power

Knowledge of optimum irrigation and water saving is required more than ever as South Africa faces the challenges of climate change and food security. South Africa is essentially a dry country, and water is therefore a critical resource that requires careful use and management. Considering that the irrigation industry cannot survive without the application of water, it is vital that the people entering this industry are well trained to understand the importance of careful planning, correct installation, efficient operation and ongoing and consistence maintenance of the irrigation systems. The National Water Act, 1998 (Act 36 of 1998) dictates water must be protected,

used, developed, conserved, managed and controlled in a sustainable and equitable manner.

The youth and specifically the learners at schools in South Africa represent the greatest asset for a nation's future and as future innovators and leaders in the water sector, WRC together with SABI invested in irrigation training at agricultural schools to develop them as a strategic move for economic growth. By equipping young individuals with the necessary knowledge, abilities, and competencies, they are empowered to understand the water and specifically the irrigation sector to contribute meaningfully to optimal water use, now and into the future.

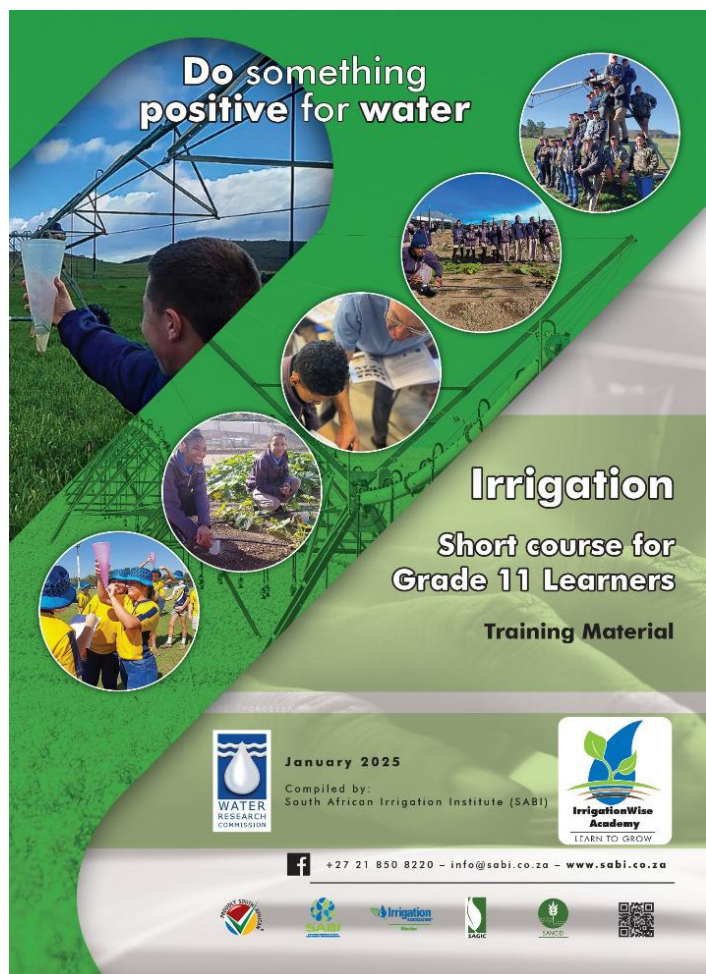
SABI Irrigation training

The South African Irrigation Institute's mission, as a custodian of irrigation practice and knowledge in South Africa, is to promote the optimal and efficient use of irrigation water and water conservation in South Africa via knowledge sharing. The knowledge and skills vested in SABI's members empowers them to train people in the efficient use and management of water.

The WRC funded project: SABI Irrigation school training, is a two-day course at agricultural schools on the basic concepts of efficient water use, irrigation and evaluation of an irrigation system. It includes inter alia: Introduction and background of irrigation in South Africa; Crop water requirements-how much water do the plants need; Irrigation scheduling plan; Introduction to hydraulics and irrigation equipment; Emitters; Pipes and

fittings; Valves and filters; System-evaluation (theory); and System-evaluation (fieldwork). After the training program, learners also write a one-hour exam.

The training manual



A practical manual (See Figure 1) was compiled specially for use at school level for grade 11 learners by using information from the recently published Irrigation Design Manual

Table of Contents

Table of Contents

- Chapter 1:** Introduction to irrigation
- Chapter 2:** Crop water requirements
 - Practical 1:** Irrigation requirement planning
- Chapter 3:** Irrigation systems
- Chapter 4:** Irrigation engineering principles
- Chapter 5:** Equipment-Emitters, pipes, fittings, valves and filters
- Chapter 6:** Pumps
 - Practical 2:** Emitters, Pipes and Fittings
- Chapter 7:** Evaluation of an irrigation system (theory)
 - Practical 3:** Evaluation of an irrigation system (fieldwork)

Figure 1: Irrigation Short course Manual for grade 11 learners



Figure 2: Training of grade 11 learners

(WRC Report No. TT 819/1/20) and Irrigation User's Manual (WRC Report no. TT 819/2/20) together with information from private irrigation companies.

Irrigation training was carried out, so that the learners understood the process of efficient irrigation water management with the use of irrigation systems. It was carried out in an interactive manner with a basis of theory and enhanced with practical work to meet the knowledge, practices and expectations of the learners.

For SABl and the WRC, the biggest value of the course is to help spread the message that water is a scarce commodity and should be used sparingly for irrigation of agricultural crops. The course places the emphasis on practicing irrigation correctly, to reduce water and electricity consumption without sacrificing crop production.

Schools where training took place

There are roughly 6 000 high schools (grade 7 to grade 12) in South Africa and amongst them there are several agricultural and academic schools offering an Agricultural technology course with irrigation as one of the focus areas. The teachers are however not subject matter specialist in irrigation and have a need of assistance.

The past year irrigation training was presented by lecturer and past SABl president Felix Reinders and fellow SABl lecturer Uli Peters to 772 Grade 11 learners at 21 schools in 9 provinces of South Africa. (See figures 2 and 3).

The schools where irrigation training took place the past year are shown in table 1.
Table 1: Schools where SABl training took place in 2025

School Number	School	Province
1	Weston Agricultural College	KZN
2	High School Kempton Park	GP
3	Unicom Agricultural Secondary School	FS
4	High School Bekker	GP
5	High School Wagpos	NW
6	Ceres Secondary School	WC
7	High School Charlie Hofmeyr	WC
8	Marlow Agricultural High School	EC
9	High School Jacobsdal	NC
10	High School Witteberg	FS
11	High School Merensky	LP
12	Kylemore Secondary School	WC
13	High School Rob Ferreira	MP
14	Augsburg Landbouginnasium	WC
15	High School Overberg	WC
16	High School Porterville	WC
17	Boland Agricultural High School	WC
18	High School Stellenzicht	WC
19	High School Hex Rivier	WC
20	High School Calitzdorp	WC
21	High School Robertson	WC

Conclusion

SABl with the support of WRC and private companies, plays a vital role in training learners at high schools investing in our youth to develop them and giving them insight in efficient water use and a foundation in irrigation as a career.

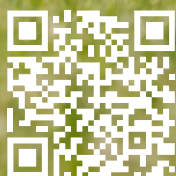


Figure 3: Practical to evaluate the performance of an irrigation system

HUSQVARNA TS 114 GARDEN TRACTOR

Some machines *just keep going*

Cover more ground with the Husqvarna TS 114 garden tractor. Designed for large lawns, it features a spring-assisted 95cm cutting deck, adjustable heights, ergonomic controls, and side-by-side pedals for comfortable, precise operation. Compact enough for narrow passages, easy to store and maintain, and fitted with a towing hook, it is a versatile, reliable machine engineered for effortless use.



Scan the QR code to locate
your nearest Husqvarna dealer.

www.husqvarna.com/za
#WeAreHusqvarna

Turning Irrigation Efficiency into a Shared Responsibility



Macdex Mutema, ARC-Natural Resources & Engineering

In partnership with: Department of Agriculture (DoA), Department of Water & Sanitation (DWS), NB Systems, University of KwaZulu-Natal (UKZN)

Funded by: Water Research Commission (WRC)

South Africa's irrigation schemes are at a crossroads. Water losses, uneven distribution, and environmental pressures demand urgent action.

The Irri-Drop Report framework, developed by the Agricultural Research Council with national partners and funded by the Water Research Commission, is a concept under development. It envisions a future scorecard for irrigation schemes — measuring efficiency, accountability, and sustainability — much like the No-Drop and Green Reports used in municipal water management.

This framework will only become a reality through broad stakeholder participation. Farmers, managers, and water user associations are invited to help shape it through surveys and workshops, ensuring that the eventual Irri-Drop Report is practical, fair, and sustainable for generations to come.

What the Irri-Drop Framework Envisions

At its core, the framework asks three simple but powerful questions:

- Are we using water efficiently?
- Are we protecting our environment?
- Are we planning for long-term resilience?

To answer these, the Irri-Drop framework proposes nine assessment criteria - each one designed to guide irrigation schemes toward better performance once the framework is finalized:

1. Water Balance – Track and Fix Losses

Would measure how much water is released into the scheme compared to how much reaches users. Losses highlight where upgrades or operational changes are needed. Expectation: Schemes will monitor flows using the Water Administration System (WAS) and act quickly on inefficiencies.

2. On-Farm Practices – Use Smart Tools

Would assess whether farmers use modern methods to calculate crop water needs (SAPWAT), measure supply (electronic meters), and schedule irrigation (weather data, soil moisture probes). Expectation: Farms will adopt these technologies and maintain

irrigation systems to conserve water and boost productivity.

3. Water Quality – Protect Rivers and Dams

Would monitor return flows to ensure they do not pollute receiving water bodies. Water quality would be checked against agricultural standards. Expectation: Schemes will test return flows regularly and adjust practices to minimize environmental harm.

4. Water Management Planning – Plan for Continuous Improvement

Would focus on long-term efficiency across the water chain. Conservation measures, modernization of equipment, equitable allocation, and stakeholder access to information will be central. Expectation: Schemes will set yearly improvement targets and ensure all users are informed and included.

5. Maintenance Planning – Be Proactive, Not Reactive

Would keep infrastructure in optimal condition to reduce losses and prevent interruptions. Schemes will be assessed on proactive maintenance schedules and emergency protocols. Expectation: Schemes will move from “fixing when broken” to planned, preventative maintenance.

6. Condition Assessment – Inspect and Score Assets

Would involve regular inspections and scoring of infrastructure to reveal its state and guide upgrades. Expectation: Schemes will conduct inspections and use scores to prioritize investments.

7. Technical Competency – Build Skills Across the Team

Recognizes that efficiency depends on people. The framework will assess whether staff and subcontractors have the right skills, training, and responsibilities. Expectation: Schemes will invest in training, fill skill gaps, and ensure subcontractors meet competency standards.

8. Budgeting – Align Money with Priorities

Would evaluate whether financial resources are adequate, aligned, and prioritized for critical needs. Expectation: Schemes will close

funding gaps, reallocate resources wisely, and manage financial risks.

9. Credibility & Enforcement – Ensure Trust and Compliance

Would assess whether data is credible and regulations are enforced. Alignment with national legislation and compliance monitoring systems will be key. Expectation: Schemes will build trust by reporting accurate data and enforcing rules fairly.

Why Stakeholder Participation Is Crucial

The Irri-Drop framework is not yet a finished report — it is a vision that requires collaboration to become reality. Its success depends on the voices of farmers, scheme managers, water user associations, and regulators.

- Surveys will identify stakeholders across South Africa.
- Workshops will allow participants to shape the criteria, weight factors, and reduce bias.
- Your input matters: Without active participation, the framework risks remaining a concept. With it, Irri-Drop can evolve into a living tool for sustainable agriculture.

As Dr. Mutema explains, “Stakeholder consensus is essential. Only by working together can we ensure that irrigation schemes are efficient, fair, and environmentally responsible.”

The Call to Action

The Irri-Drop framework is more than an idea, it is an invitation. An invitation to farmers, water managers, and policymakers to take part in shaping the future of irrigation in South Africa.

Participate:

Complete the stakeholder survey here:

Fill out the form

Contact:

Dr. Macdex Mutema:

mutemam@arc.agric.za +27 12 842 4054

Precision Irrigation:

A Component of Precision Agriculture

From producer to consumer, everyone is aware of the statistics around water scarcity, agricultural water use, and increased food demand driven by population growth. For many years, the challenge has been clear: We need to produce more food while continuously increasing water-use efficiency.

Dr Zanele Ntshidi, Node Manager of Arid Lands at the South African Environmental Observation Network, advocates for smart water use in agriculture by reminding us that 80% of South Africa's land mass falls within semi-arid to arid zones. "It is imperative that we continuously increase water-use efficiency in agriculture." Dr Ntshidi emphasises the role of increased efficiency in improved stability and resilience across crop production. "Enhancing efficiency ensures stable and improved crop yields. It allows for increased production using less water, thereby mitigating the impacts of droughts. By further improving efficiency and getting more crop yields per drop of water, agricultural systems can become more resilient, sustainable, and capable of feeding the growing population of South Africa." She adds that key highlights of her research, which is focused on long-term observations and developing decision support tools that assist with irrigation scheduling, substantiate the benefits of adopting smart water-use technologies, such as precision irrigation and soil moisture monitoring.

By ensuring that the crop is replenished with the exact amount of water it needs, it reduces non-beneficial water losses, prevents over-extraction of freshwater sources, and lowers the carbon footprint of food production. Dr Ntshidi adds that precision irrigation plays a fundamental role in climate-resilient agriculture by transitioning water management from generalised approaches to data-driven, site-specific systems. "It acts

as a key adaptation strategy in water-scarce regions by delivering precise amounts of water directly to the root zone, reducing waste, and improving crop resilience against droughts and unpredictable rainfall patterns. Through precision irrigation, a producer can be certain that the applied water is used for the benefit of plant production rather than non-beneficial use that leads to water being lost to evaporation, for example." Holistic Precision Approach It is in this context, that Charl van Reenen, Agronomy Manager at Netafim Southern & East Africa, calls for an integrated approach to precision irrigation. "Precision irrigation and the efficient use of water in agriculture should not be viewed as a silo in our mission towards improved resource-use efficiency on the farm. It is one component of a broader precision agriculture approach." Van Reenen continues that precision irrigation fully integrates with all other precision inputs and actions. "The implementation of a precision irrigation system and the necessary planning that goes into it, also enables the precise use of other inputs. It also enables timely and precise execution of actions based on insights from other precision tools, such as soil analyses and sensor data. Whether it is through more efficient use of fertiliser, reduced disease pressure or exact irrigation based on phenological phases, precision irrigation leads to reduced risks and improved sustainability of the entire farming operation."

When approaching precision irrigation holistically as part of a total precision agriculture approach, says Van Reenen, the mutual interaction between different precision inputs becomes clear. "One such example is the beneficial interaction between soil analyses and mapping and precision irrigation. The knowledge gathered from soil analyses directly informs scheduling approaches based on soil differences. In turn, the management tools unlocked by precision irrigation system

allow us to react to the data gathered by these activities and irrigate exactly according to crop requirements and soil characteristics at block level. Similarly, precision irrigation adds further value to precise crop and cultivar selection. With the right equipment and scheduling approach each plant can be irrigated according to its requirements.” Van Reenen continues that precision irrigation is about much more than driplines, filters, and irrigation controllers. “It is about the collection of data, the expert interpretation of collected data and the precise execution of decisions based on this data.” The key role of precision irrigation as one part of a whole in a precision agriculture approach is further emphasised when we understand the impact of water on every aspect of crop growth. “Water drives the uptake of nutrients. It is critical to root development, as well as flowering and fruit set that directly impacts yield quality. If water is not managed correctly, we lose the benefit of many other inputs and significantly constrain the plant’s potential.”

The Producer’s Perspective When reminding producers and other role-players about our

responsibility to use water efficiently given its scarcity, the message can easily become skewed with emphasis only on the call to save water. Conversations with precision irrigation users, however, balances the conversation, with focus on the value of precise water management for better results in the field. Jonathan Miller, Farm Manager at Redberry Farm near George says that their water-use philosophy is based on giving plants exactly what they need when they need it, without wasting water. “Our aim is to produce superior quality fruit and profitable yields, while farming sustainably. It goes far beyond saving water. Especially with crops where consistent moisture is critical to plant health and fruit quality. In our strawberries and kiwis, proper irrigation management helps plants grow more consistently and improves how efficiently nutrients are used. It helps us manage inputs better while supporting good yields and fruit quality.” Jantjie Jonker, owner of Jakkalsvlei Wine Farm near Herbertsdale, shifts the focus to precision irrigation as a management tool. “Yes, we do not have a lot of water and drip irrigation allows us to use the water we have optimally, but it also





allows us to turn our focus on grape quality over quantity into results. We can precisely manage plant moisture to control yield and canopy growth. In short, drip irrigation allows us to precisely manage vineyard productivity, giving us greater control.” Water Mind Shifts Marco Appel, Agricultural Economist at Netafim Southern & East Africa, adds to the conversation by emphasising the importance of a long-term view when it comes to precision irrigation decision-making. “Two important mind shifts are important in this regard. The first is that we must not view water as an input, but rather a strategic asset. Like land and capital, it must be protected and invested in. It is about water stewardship with the future in mind. The second is to think of the actual cost of water. Water cost is much more than the water tariff and includes pumping costs, irrigation system maintenance costs, labour costs and more. It is especially important that all costs are considered when making irrigation investment decisions and when weighing up the capital cost of a system against the long-term benefits and savings.

When these mind shifts are combined with a long-term view and data-driven approach, the economic value of investing in precision irrigation becomes clear.” More Than the Sum of its Parts It boils down to the fact that one plus one is much more than two when different precision practices unlock more potential from each other. Van Reenen advises that a holistic view is crucial during the project planning phase to make the near-idyllic reality described here a reality. Precision irrigation requires an irrigation system that is designed and installed with all resources and production goals in mind, with the aim of ensuring optimal production. “When you develop a new farming project, a few questions must be answered, and several experts must inform the process. Irrigation planning is only one aspect of this, and it is important that irrigation is not planned in isolation from all the other aspects of precision agriculture. It must be informed by data and insights from other aspects of the project, while also informing decision-making across these aspects.”

Hydroponics for Sustainable Agriculture

Milcah Matjeke, Tsietso Khajoane, Salome Lebelo,
Moremi Makgoka, Mariette Truter
ARC

Hydroponic agriculture is gaining popularity worldwide due to its numerous advantages, which include the ability to produce in non-viable spaces and high-quality produce with minimal environmental impact. This method is appealing to farmers that want to produce quality crops despite challenges like limited land, poor soil conditions, and

shortages of water. As the world shifts towards more sustainable means of food production, hydroponics offers a glimpse into the future of farming, one that is more efficient, sustainable, and better equipped to complement conventional agriculture in feeding the ever-growing global population. Whether through coloured tomatoes or other crops, hydroponics is certainly a technology worth watching.



Figure 1 Formal information session at the ARC-VIMP farmers day event



Figure 2 Demonstration of seedling preparation to the farmers

Agricultural Research Council-Vegetable Industrial and Medicinal Plants (ARC-VIMP) Farmers' information Day

ARC-VIMP, Roodeplaat hosted a farmer's information day event, with the theme of producing coloured tomatoes in hydroponic systems. The event showcased new farming methods and helped people see how technology is shaping and improving modern agriculture. The day began with an informative presentation that discussed coloured tomato breeding and production practices, as well as diseases and pests that are notorious in

tomato plants and fruit. The day turned into an adventure after the presentation, where farmers went on an escorted tour to see firsthand the process of hydroponic coloured tomato cultivation, from seedling production to fruit harvest. The demonstration began at the nursery, where the team cultivated seedlings with precision. The tour then proceeded into the hydroponic production tunnels, where the true experimentation of hydroponics was discovered. The day unveiled the tremendous potential of hydroponics to help transform tomato productivity.



Figure 3 Farmers visiting one of the hydroponics tunnels

Hydroponic Systems Explained

The ARC-VIMP has two main hydroponic systems used, a closed hydroponics and open bag systems, which were both demonstrated to the farmers. The closed hydroponics systems include the gravel film technique (GFT) and nutrient film technique (NFT). The systems produce varying benefits and are suited to certain agricultural requirements. In the GFT, plants are cultivated on 20 m long gullies or trenches that are 0.06 m deep, filled with gravel stones with a diameter of 3 to 4 mm as a growing medium. The water is pumped through to the top of the gully through the spaghetti tubes and flows back to the reservoir through gravitational acceleration at a slope of 3%. The use of gravel creates an ideal root zone for water absorption, efficient nutrient uptake, and eventual root growth through its oxygenation capabilities. Generally, these systems are recommended for leafy vegetables and herbs. In the NFT, a thin layer of nutrient-rich water flows through slightly sloped channels over the plant roots. The roots take up the water, nutrients, and oxygen they need, while the extra solution is collected and reused, making the system efficient.

The bag system involves plant growth bags that are filled with a porous substance such as sawdust, or perlite. The bags are placed on 0.6 m wide, and 30 m long ridges covered with a white plastic. The open bag system is most used by small businesses because it covers high-market-value crops with a quick return on investment. However, both systems are effective, but the choice between the gravel and bag systems depends on the specific needs of the farmer, including budget, scale of operation, and available space. Closed hydroponic systems provide better root support and efficient use of water and nutrients, while open bag systems are well suited for producing high-value crops and can offer a relatively quick return on investment for farmers. The Farmer's Information Day at ARC-VIMP highlighted hydroponics as a practical and sustainable approach to crop production. By combining innovative technologies with farmer education and knowledge sharing, hydroponic systems have strong potential to contribute to more efficient and sustainable agricultural practices in the future.



Weather Risk App:

A new online tool to help South African farmers manage weather risks

Dr Sarah Roffe

Agrometeorology Division, ARC – Natural Resources and Engineering

South Africa experiences highly variable weather, with periods of extreme heat, heavy rainfall, prolonged dry conditions, and occasional extreme cold affecting agricultural production and water availability across many regions. Consequently, farmers and others involved in weather-sensitive activities, such as agriculture, require reliable and accessible information to support planning and day-to-day decision-making. However, weather and water-related information is not always easy to access in a form that is practical and relevant, especially at more local scales, such as the farm level. To help address this need, the Agricultural Research Council (ARC) has developed the Weather Risk app (www.weatherrisk.arc.agric.za). It is a freely available web-based tool that provides national coverage and brings together key weather and water

availability indicators across South Africa in a single interactive interface (Figure 1).

Introducing the Weather Risk app

The Weather Risk app has been developed by the ARC, with researchers from the

Agrometeorology Division leading the scientific development in collaboration with systems developers and researchers from the Water Science Division. The app is freely available online and can currently be accessed via a desktop computer. As shown in Figure 1, the app provides national coverage across South Africa, while users can explore



conditions in greater detail at local scales within the interface. Observed weather and water-related data are combined with short-term forecast information, bringing multiple

weather and water availability indicators together in a single interactive interface that enables users to assess current conditions and potential upcoming risks. The app has been designed to support practical decision-making and is intended for farmers, extension officers, agricultural advisors, researchers, and others working in weather-sensitive sectors who require accessible and reliable information for planning and risk management. Although the app has been designed to be relatively simple, guidance on using the Weather Risk app is available through an online user guide (https://github.com/climindex/hydroclimsa/blob/main/App_user_guide/Weather_Risk_app_user_guide.md#weather-risk-app-user-guide).

Turning weather and water information into useful insights

The Weather Risk app presents weather and water availability information in the form of indices, which are designed to make complex data easier to interpret. An index, with the plural form indices, summarises weather or water conditions over a defined period (e.g., over several days to seasonal timescales) into a single, meaningful measure. For example, temperature values can be summarised into the number of heat stress days over a recent period, such as the number of days when maximum temperatures exceeded 30 °C

over the past month. Similarly, rainfall data can be summarised into accumulated rainfall totals over a range of periods, while minimum temperature data can be used to indicate the occurrence of frost days.

Numerous indices are available on the Weather Risk app using both observed (weather and water-related) data and short-term forecasts. Rather than only presenting raw daily values, the indices in the app provide simplified indicators that help users quickly identify conditions such as unusually hot spells, cold or frost-prone periods, recent rainfall accumulations, periods with high evapotranspiration levels, and developing dry or wet spells that may influence farming activities and water management. Figure 2 shows examples of two indices currently available on the Weather Risk app. These examples show heat stress days and accumulated rainfall, shown spatially as is available on the app, and to illustrate how such conditions can vary across South Africa.

From information to action: a practical example

Weather and water availability information is most useful when it can support practical decisions on the ground. Observed indices on the Weather Risk app help users understand

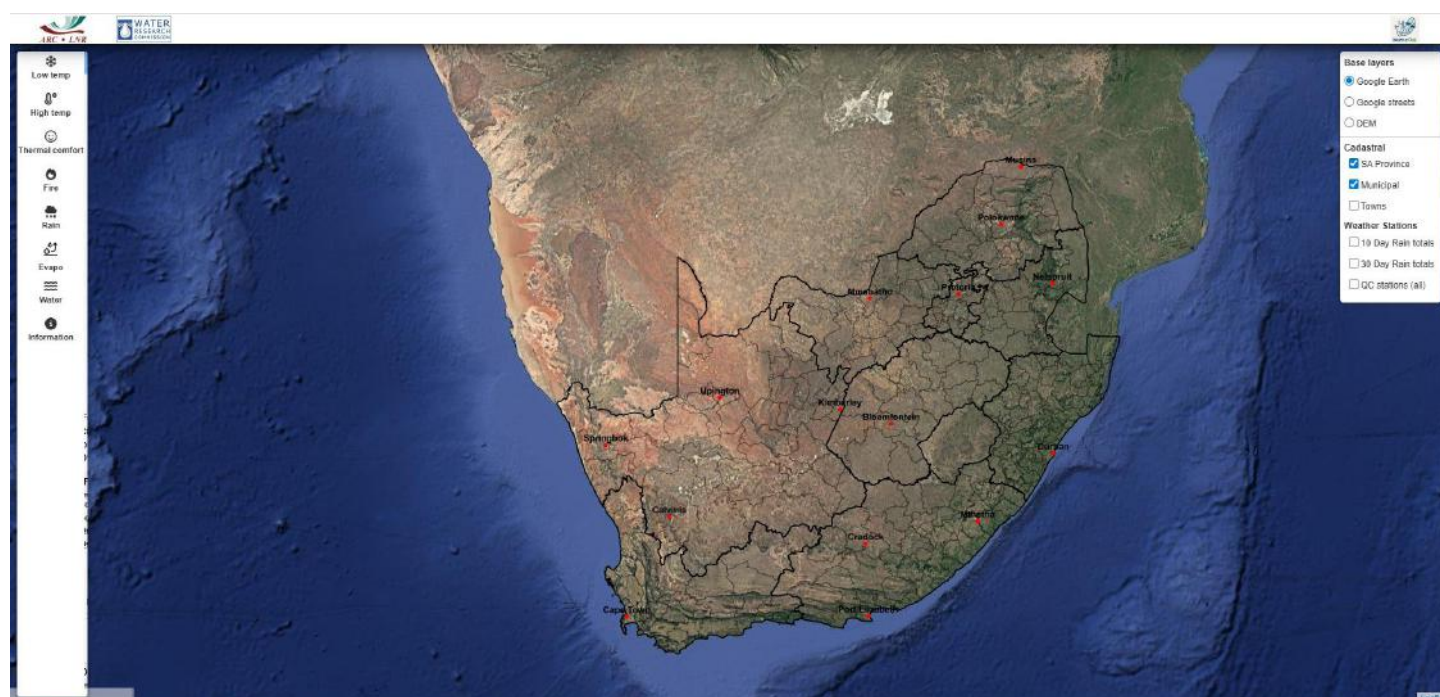


Figure 1: Homepage of the Weather Risk app showing the national coverage and the interactive web-based interface.

recent conditions, such as accumulated rainfall, recent heat stress, or frost occurrence, allowing farmers and advisors to assess current impacts and adjust management where necessary. Forecast-based information then provides an opportunity to anticipate conditions in the days ahead and plan proactively. Several forecast indices are available on the app and, when considered together, these can provide a more complete picture of developing conditions and potential risks. Focusing on the value of the forecast information available in the app, Figure 3

shows the seven-day average maximum temperature forecast that was issued for 11 to 17 February 2026, indicating widespread hot conditions across several parts of South Africa, with temperatures in some areas expected to exceed 35 °C. Information like this could support short-term planning and risk reduction. Livestock farmers, for example, could use such forecasts to ensure adequate shade and water availability, adjust grazing or handling times, and reduce heat exposure during peak temperature periods, while crop producers could use the same information

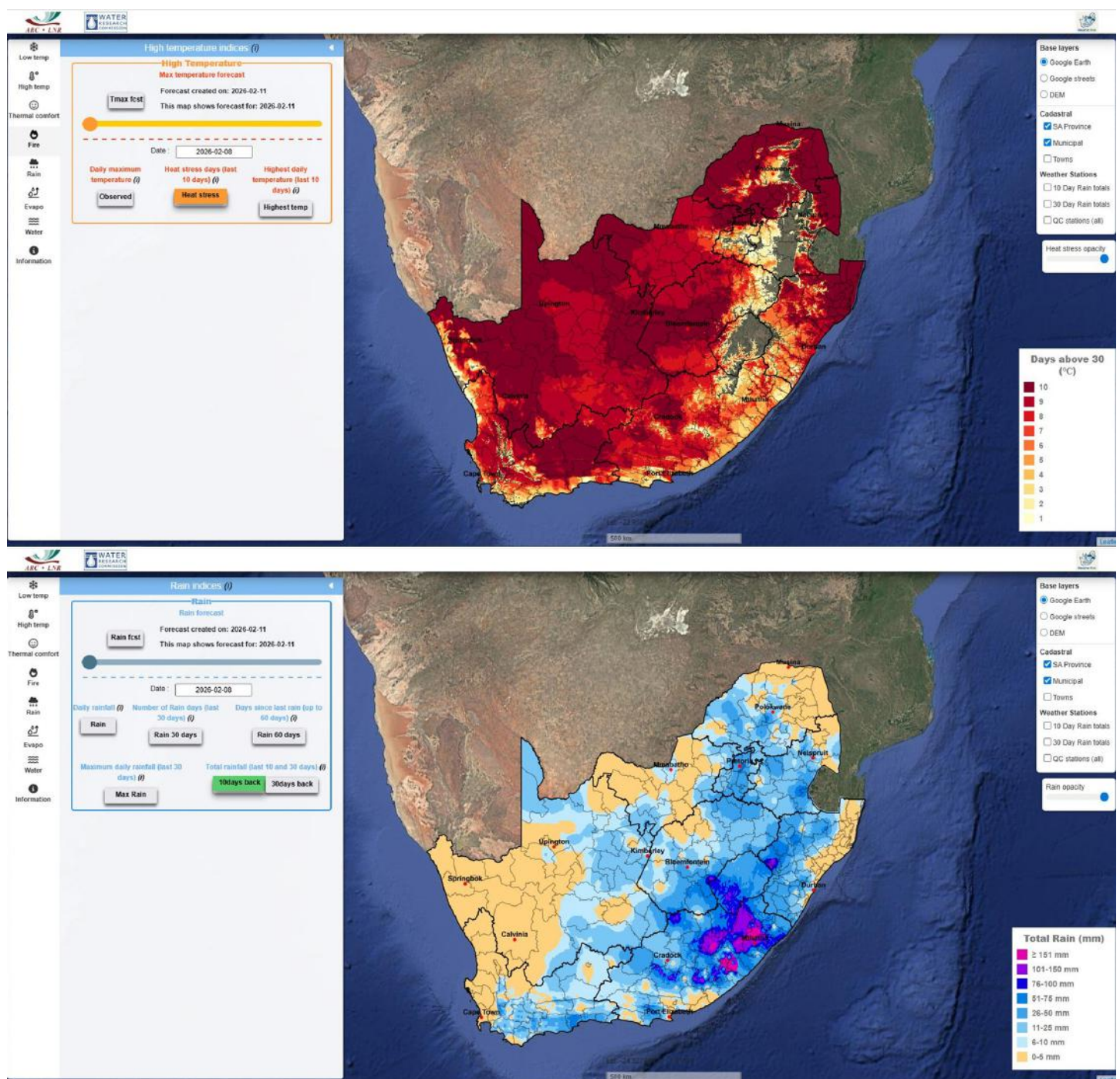


Figure 2: Examples of weather risk indices available on the Weather Risk app: (a) heat stress conditions, and (b) recent rainfall conditions, both for the last 10 days as of 8 February 2026.

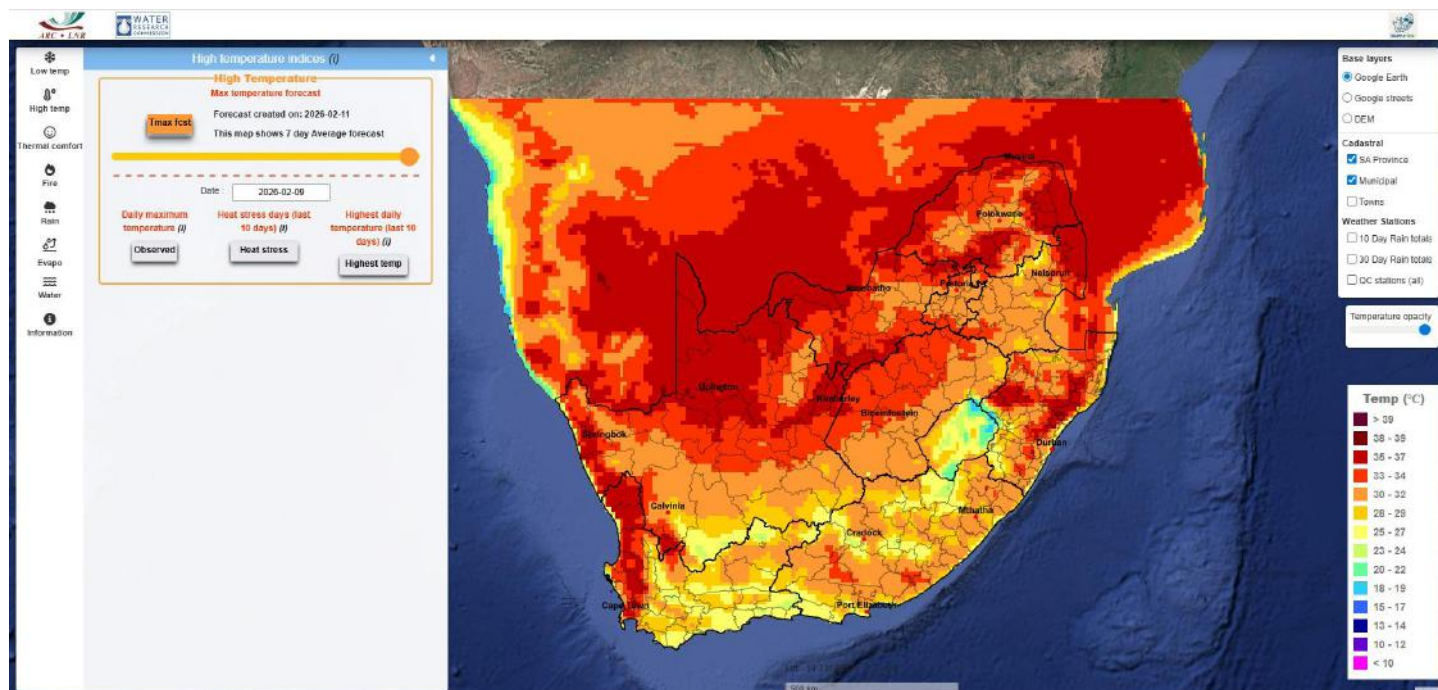


Figure 3: Seven-day average daily maximum temperature forecast for 11 to 17 February 2026.

to guide irrigation scheduling, protect sensitive crops where possible, and prepare for increased water demand. By presenting both observed and forecast information in a clear and accessible format, the Weather Risk app supports more proactive and informed decision-making across weather-sensitive agricultural activities.

Built with users, and still growing

The Weather Risk app has been developed with input from a range of stakeholders across the agricultural sector, including farmers, extension officers, and other users of weather and water information. Feedback received during development has shaped the app's design and functionality, ensuring it remains practical and relevant for real-world decision-making. Ongoing feedback is welcome, and the app will continue to evolve as additional user input is received. Planned enhancements include the introduction of user login and customisation features, the development of alert functions, the addition of further indices, and the continued refinement of existing tools. As the app grows, opportunities for longer-term sustainability and potential commercialisation are also being explored to support ongoing development and expansion of its services.

Readers are encouraged to explore the Weather Risk app and consider how it may support planning and risk management within their own activities. Feedback from users remains an important part of the app's ongoing development and can be provided directly via the online feedback questionnaire available on the site (<https://forms.gle/z2aSdZhHvhPqwRHh7>). By making accessible weather and water availability information more widely available, the Weather Risk app aims to support more informed and proactive decision-making across South Africa's weather-sensitive agricultural sector.

Acknowledgments

The Weather Risk app was developed by the Agricultural Research Council (ARC) with financial support from the Water Research Commission (WRC) under the project *Development of a climate and water availability indices app to support decision-making across South African water management areas* (Project number C2023/2024-01182). The views expressed in this article are those of the author and do not necessarily reflect those of the ARC or the WRC.

Inquiries: RoffeS@arc.agric.za

Plough Through Summer Tasks: 5 Ways A Garden Tractor Can Lighten Your Load

Summer, with all its beauty and bounty, has arrived, ushering in peak growth season. Lawns thicken and spread, foliage fills out, and crops push into their key production phase, while weeds are never far behind. For homeowners, landscapers, and small-scale farmers, it can mean many hours spent mowing, hauling, digging, and spraying... unless you have the right tools for the job.

According to Lorna Ochiel, East Africa Representative, a garden tractor is one of the smartest investments you can make, as it dramatically cuts the time spent on essential maintenance tasks. "Time is the one thing you can't get back. Whether you're managing a large garden of an acre or more, a smallholding or small farm, saving hours every week isn't just about convenience - it often translates directly into saving money too."



She shares how a Husqvarna tractor turns summer's toughest tasks into quick and efficient jobs:

1. Mow more in less time

Summer lawn growth can quickly get out of control, especially on larger properties. With powerful engines and wide cutting decks, garden tractors like the Husqvarna **TS 220TD** can mow large areas in a fraction of the time it would take with a walk-behind mower. For a smallholding or estate, this could mean completing a job in one morning instead of over two or three days - freeing up time for other priorities or reducing the need to hire someone else to do the job

2. Haul heavy loads efficiently

Moving compost, manure, soil, mulch, or debris by hand can consume days of labour. Unlike a ride-on mower, which is just for mowing lawns, a garden tractor can tow attachments such as trailers, spreaders, or other implements, making tasks like transporting materials quick and easy. For example, transporting several wheelbarrows of compost in one trip not only saves hours but also reduces fuel and labour costs. Over the course of a season, this efficiency adds up to real savings.

3. Spray more effectively with less effort

Summer is also the season when pests are at their most active, and regular spraying can make the difference between a healthy crop and a disappointing harvest. By attaching a tow-behind sprayer, your tractor can cover large areas evenly and quickly. This means pests can be managed without extra labour or costly standalone equipment, saving time and money while protecting crops.

4. One machine, multiple tasks

From collecting leaves and clearing debris to towing irrigation equipment or distributing feed, a single tractor can replace multiple pieces of equipment. The Husqvarna **TS 222TDF**, designed for larger properties and smallholdings, is particularly effective, making light work of time-consuming tasks.

"In a season that is both demanding and rewarding, whether you're a small-scale farmer

or busy gardener, a Husqvarna garden tractor helps you get more done with less effort. By handling the work of several machines, it reduces the need for extra equipment, labour, and fuel," Ochiel concludes, "ultimately helping you to get the most value from your investment."

Discover how a Husqvarna garden tractor can lighten your workload at

<https://www.husqvarna.com/ke/garden-tractors/> or your nearest dealership.



About Husqvarna

Husqvarna, a brand within Husqvarna Group, is a market leader in innovative and high-quality products and services for shaping green spaces in parks, forests and gardens. Since 1689, Swedish-born Husqvarna has a strong focus on research and development and is a pioneer in robotic lawn mowers and chainsaws. Today, the product portfolio consists of the next generation of robotic mowers, riders, chainsaws and trimmers for professional as well as private use. Sustainable value creation, product innovation and digitalisation remain important for the journey ahead. Husqvarna products are sold in more than 100 countries. Husqvarna Group, which also includes Gardena and Husqvarna Construction, has 13,300 employees in 40 countries around the world and net sales in 2024 amounted to SEK 48,4 billion. Husqvarna Group is listed on Nasdaq Stockholm.

Rooibos Maintains Course Amid Climate and Trade Pressures

Following President Cyril Ramaphosa's State of the Nation Address, which highlighted agriculture as a rapidly expanding export sector and reaffirmed government's commitment to infrastructure and global market expansion, the Rooibos industry enters 2026 navigating climatic uncertainty, shifting global trade dynamics and heightened regulatory scrutiny.

Looking ahead, Dawie de Villiers, Chair of the South African Rooibos Council (SARC), says the industry's defining feature will continue to be its ability to balance resilience with restraint.

"Rooibos is not a volume-driven commodity. Its long-term value lies in quality, origin integrity and responsible stewardship," de Villiers said. "As the industry navigates 2026, stability rather than expansion will remain its strategic anchor. Our approach prioritises reliability and trust – factors that underpin both local livelihoods and global confidence in our product."

Production: Variability within a stable system

Rooibos production remains inherently variable, reflecting its dryland nature and



reliance on natural rainfall within a narrowly defined geographical area. Estimated production for 2025 is approximately 15 000 tons, down from 17 000 tons in 2023, continuing a cyclical pattern linked to rainfall distribution, planting cycles and environmental conditions.

Over the past two decades, annual production has fluctuated between 13 000 and 25 000 tons, underscoring both the resilience of the system and its sensitivity to climate variability. Importantly, combined local and international demand has remained relatively stable at around 18 000 tons per year, reinforcing industry consensus that sustainability, plant health and soil resilience must take precedence over volume-driven growth.

With drought and heat stress affecting growing regions, the current season's harvest cannot yet be reliably estimated.

Exports: Structural strength and widening reach

Exports remain a cornerstone of the industry's economic performance. Rooibos is now exported to more than 50 international markets worldwide, underscoring its growing global relevance. In 2025, Rooibos exports passed the 10 000-ton milestone for the first time, reaching approximately 10 930 tons, up from around 5 900 tons in 2015.

Japan retained its position as the largest export market, accounting for 33% of total exports in 2025 with volumes of approximately 3 606 tons. While established markets, such as Germany, the Netherlands, UK and France continue to provide stability, newer markets, such as Indonesia, Sri Lanka and China are showing notable momentum.

It is encouraging to see export markets and product channels continuing to expand. At the same time, increasingly engaged consumers are paying closer attention to product origin and authenticity when making purchasing decisions. As a single-origin product, Rooibos has a compelling story to tell.

The industry's growth offers lessons for other niche agricultural sectors, such as honeybush, baobab or specialty herbal products. By prioritising reliability and brand



credibility, Rooibos exporters can compete on the global stage. This contrasts with some other commodities, like certain fruit or grain markets, that experience short-term spikes followed by price collapses due to overextension.

Product evolution and consumer demand

Legally a tisane (botanical drink), not a tea, Rooibos is carving out a global niche beyond traditional brews. While often grouped with the tea sector, its growth is increasingly fuelled by diverse formats – from bulk exports to ready-to-drink beverages, kombucha, skincare ingredients, functional foods and even mixology in the hospitality sector.

This diversification is supported by a deep and growing scientific foundation. Since 1962, 735 peer-reviewed articles on Rooibos have been published, with research activity spanning 62 countries. Over the past decade alone, SARC funded 24 research studies, reinforcing Rooibos' credibility in health, nutrition, and wellness markets.

“Consumers and buyers increasingly demand proof – whether in science, provenance or sustainability. Rooibos delivers on all fronts and that credibility is our strongest currency.”

Climate, sustainability and governance

Climate variability remains the industry’s most significant structural risk. Irregular rainfall, rising temperatures and erratic seasonal patterns continue to influence yields and long-term planning.

Governance remains a key differentiator. Rooibos continues to benefit from international Geographical Indication (GI) protection, safeguarding its name, origin and authenticity. Efforts are underway to formally align local GI protection under the Agricultural Product Standards Act with international systems.

Equally significant is the industry-wide Access and Benefit Sharing agreement, the first of its kind globally. Between 2019 and 2024, R42.7 million was shared with Traditional Knowledge holders.

The SARC reports that the export sector now supports thousands of rural households, with small-scale farmers forming a critical part of

the supply chain. Income generated through exports sustains communities in the semi-arid Cederberg region, supporting local processing and packaging enterprises.

Outlook: Cautious confidence

Looking ahead, the Rooibos industry’s priorities are clear – climate resilience, regulatory readiness, market diversification and continued investment in research, quality and traceability.

“The industry is realistic about risk, but confident in its foundations. Rooibos has shown that with collaboration and good governance, it is possible to build value without compromising integrity. This is not just about the product, it’s about sustaining communities, supporting rural economies and maintaining SA’s reputation abroad,” emphasises de Villiers.

As global markets become more demanding, Rooibos’ strength lies not in scale, but in credibility – a position the industry intends to defend.

Smaller in scale than sectors, such as mining, citrus or wine, Rooibos nonetheless demonstrates how niche agricultural products can deliver measurable economic impact.



Cannabis and Hemp's slow journey of policy formulation in South Africa

Wandile Sihlobo,

There is still room for advancing the cannabis and hemp industries in South Africa. But we can't position these as major gamechangers in our agricultural sector's growth trajectory; they are mainly an addition, like other commodities. Still, some work remains to finalise the legislative and regulatory framework in this area.

I know many people and organisations are hard at work with the government to complete the regulatory matters. Others, like the good folks at the Agricultural Research Council (ARC), are working to advance cannabis and hemp research and, importantly, seed breeding for this plant.

I must admit, though, that we have been slow in this cannabis and hemp path. A few years ago, this was a hot issue. And now, globally, the mood is somewhat downbeat on cannabis. Still, that is no reason to change our focus in South Africa. There are cycles in these things, as with other soft commodities.

We need to move and ease the environment for commercial production and reduce the talk and announcements about the plant. The announcements often seek to position the plant as if it will solve all our problems, but that is not the case.

We have been slow to provide a new, clear regulatory path for this plant, and the licensing fee has been somewhat prohibitive for some people.

But my caution about the over excitement about the plant is not that I'm pessimistic. Indeed, it is likely that when we finally progress



with cannabis and hemp research, regulations and a clear policy framework, the plant could create opportunities for canna-tourism, particularly in rural areas of the Eastern Cape, KwaZulu-Natal, and Limpopo. Of course, life won't drastically change because of this plant, but it will bring some value.

Importantly, we need to consider practical ways to ensure that production and value chains don't mainly develop in areas that have always been the leading agricultural zones and urban areas with better access to investment.

The communities of the Mpondoland region of the Eastern Cape have been growing this plant in the shadows of the law for many years. They should benefit from its liberalisation, along with KwaZulu-Natal and Limpopo. Incentives to drive the industry towards these regions will be necessary.

Source:

Republished with permission of the author Wandile Sihlobo: Agricultural economist and author from South Africa. Wandile@substack.com



Study finds R40 billion potential for hemp industrialisation in South Africa

A domestic industrial hemp market opportunity valued at R40 billion by 2040 is within South Africa's reach - but only with the right industry development and policy support. That is the headline finding of a landmark industrialisation study published today by the Localisation Support Fund (LSF), in partnership with the Presidency, the Industrial Development Corporation (IDC), and the Department of Trade, Industry and Competition (the dtic). The study maps a credible path through which hemp industrialisation could become a meaningful driver of reindustrialisation, diversification, decarbonisation, export growth, and inclusive rural economic development across the country.

Commissioned by the LSF and undertaken by Zageta Solutions together with the Development Policy Research Unit (DPRU) at the University of Cape Town, the study builds on previous work and aligns with the objectives of the National Cannabis Master Plan - translating its policy ambitions for industrial hemp into practical, implementable industry actions. In doing so, it establishes

a substantive research base from which the development of the sector can meaningfully advance.

Globally, the hemp market is projected to grow from approximately US\$10 billion in 2025 to US\$37 billion by 2032 - and South Africa is well-positioned to capture a meaningful share of that expansion. Diverse agro-ecological zones and a counter-seasonal production cycle mean South Africa can supply global markets year-round, filling gaps left by Northern Hemisphere producers. Critically, it does not need to build from scratch - established manufacturing clusters in automotive, textiles, pulp and paper, and food processing provide ready-made demand pathways for hemp-derived inputs, lowering the barriers to commercial scale-up.

As a later entrant, South Africa can also bypass the costly trial-and-error phase that slowed early adopters, instead designing value chains that are competitive and standards-aligned from inception. When combined with South Africa's pivotal role as a continental trade gateway under AfCFTA, and the strong alignment between hemp industrialisation and

national goals around decarbonization, rural economic revival, and social inclusion, the case for South Africa as a future global hemp hub is compelling and credible.

Since 2022, South Africa has issued a total of 1,725 permits, granting legal cultivation rights across 29,000 hectares of land, primarily in Gauteng, KwaZulu-Natal, and the Eastern Cape - providing a solid foundation for scaling. The study however cautions that the absence of industrial-scale processing infrastructure - particularly in primary processing represents the most critical bottleneck to sector growth. Additionally, regulatory fragmentation - particularly the need to clearly separate industrial hemp from intoxicating cannabis in legislation - continues to constrain investment and industry development.

The study identifies five priority industrial pathways where South Africa's hemp sector should concentrate its early development efforts. Food and beverages stands out as the most immediately accessible, with grain-based products such as hemp milk, flour, and edible oils integrating readily into existing oilseed and food-processing platforms. Personal care - encompassing hempseed oil-derived creams, serums, and wellness products

- offers similarly low entry barriers and strong alignment with the country's existing manufacturing base, making it particularly attractive for SMMEs. Pulp and paper, meanwhile, presents a strategic opportunity to absorb underutilised straw biomass through biodegradable packaging and cellulose-based materials, leveraging technology already proven in South Africa's established forestry sector.

The remaining two priority pathways point toward longer-term industrial scale. General textiles - one of the fastest-growing hemp segments globally - is well-suited to non-woven and technical applications that can utilise fibre from dual-purpose grain crops without demanding the highest processing standards. Building and construction, driven by global decarbonisation imperatives, focuses on materials like hempcrete and insulation, with hemp hurds accounting for roughly 65% of the stalk offering substantial volumetric supply potential. Together, these five pathways were selected because they share a common profile: strong and growing demand, proven or adaptable technology, and realistic prospects for localisation within South Africa's existing industrial footprint.





Unit economic analysis confirms that mechanised, scale-based farming operations demonstrate the strongest returns, while smaller, labour-intensive models struggle to achieve profitability due to harvesting and processing constraints. Farmer returns are sensitive to access to dependable off-take markets and nearby processing infrastructure, reinforcing the need for coordinated value chain development rather than a purely supply-led approach.

Realising the economic promise of South African hemp - which the study confirms is real on both the cultivation and processing sides of the value chain - will require a deliberate minimum programme of action, not simply the lifting of regulatory barriers. At its core, this means establishing a concessional early-stage financing instrument to make the entry costs of processing infrastructure manageable and to crowd in private capital; identifying and actively supporting first-mover companies that are building the tacit and technical knowledge the sector needs across the full value chain, from seed selection and agronomic practice through to decortication and product development; and designing aggregation and clustering models that allow farmers, processors, and downstream manufacturers to develop in proximity and at viable scale.

Underpinning all of this is the need for dedicated project preparation capacity - in both public and private institutions - capable of translating the sector's potential into bankable, investible propositions. Without this combination of smart finance, early-mover support, and coordinated value chain construction, the chicken-and-egg dynamic between farmers and processors will persist, and the sector's genuine commercial viability will remain latent rather than realised.

Speaking at the launch of the report, LSF CEO Irshaad Kathrada remarked: "Industrial hemp represents one of the most compelling and versatile economic opportunities available to South Africa right now. Every part of the plant is marketable - from grain for high-nutrition foods to stalks for carbon-negative construction materials - and with domestic demand alone projected to reach R40 billion by 2040, the scale of the prize is significant. What makes this particularly exciting is that South Africa doesn't need to start from scratch. We have the manufacturing base, the agro-ecological diversity, and the research foundation to compete globally. But none of that potential convert into reality without a deliberate, coherent industrial strategy. This study makes clear that legal reform, processing infrastructure, and demand-led value chain development must advance

together, as part of a coordinated national programme. Hemp is not a niche agricultural curiosity - it is a strategic platform for reindustrialisation, rural inclusion, and South Africa's green economic transition, and it deserves to be treated as such".

Garth Strachan, Technical consultant to the PMO Presidency and the IDC added: "This high quality and important study provides a clear evidence-based roadmap for coordinated action across government, industry, and investment institutions to secure important economic objectives, most importantly to enable commercially viable investment and employment creation."

M. Ayanda Bam, Executive Director of Zageta Solutions added: "We are excited at the prospects of this study providing some direction for scaled industrial activity and to begin crowding in necessary capital to finance the sector. This this will not happen organically, however. It requires deliberate, targeted, and sequenced interventions enabled by the state and implemented by its partners."

John Jeffery, Project Manager of the Hemp and Cannabis Masterplan added: "This study is a game changer for South Africa's hemp sector, offering clear insight into a complex and evolving regulatory landscape. It helps demystify the legal and policy environment while highlighting the real economic potential of hemp. Importantly, it reinforces that hemp and cannabis are the same plant, with regulation largely determined by THC levels. By clarifying these distinctions, the study provides a valuable foundation for informed policy development and industry growth. It is a critical step toward unlocking opportunities across agriculture, manufacturing, and research in this emerging sector."

**South Africa's Industrial Hemp
Value Chain Development Study**

LSF Roundtable Event



Holding Africa's Water 30 Countries and Counting



MINING



AGRICULTURE



INDUSTRY



FOOD & BEVERAGE



MUNICIPAL



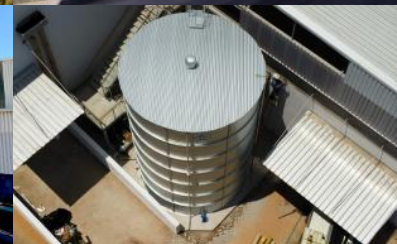
FIRE FIGHTING

- High corrosion resistance
- Cost effective
- On-site assembly
- Tough and durable
- Low maintenance
- 5kL to 4000kL
- Steel-domed roofs or open-top tanks
- Human consumption/ food grade certified
- Tanks < 350kL require no concrete foundation

www.rainbowtanks.co.za

sales@rainbowres.com

+27 (0) 11 965 6016



South African agriculture exports reach post-Covid peak, driven by market diversification

South Africa's agricultural sector has once again demonstrated resilience and global competitiveness, delivering a record export performance in the fourth quarter of 2025 despite significant headwinds in the global trading environment.

South Africa's total exports reached a record R581,5 billion by the end of the fourth quarter of 2025 and agriculture contributed R268,7 billion, the highest level since the COVID-19 pandemic. The agriculture exports grew year-on-year by an average of 9% when compared to the fourth quarter of 2024, which was R243,7 billion.

This performance was achieved despite a strengthening Rand, tighter regulatory measures in some markets, and the impact of the United States' 30% "Liberation Day" tariffs.

Minister of Agriculture John Steenhuisen said the figures reflect "A sector that is not only resilient, but increasingly strategic

in its approach to global markets. While agricultural exports to the United States declined sharply by 36% in the fourth quarter of 2025 as a direct result of higher tariffs, our diversification strategy has clearly borne fruit. Strong growth to BRIC+ countries, the United Kingdom, the European Union, and SADC more than offset those losses," he said.

Exports are still skewed towards Africa with about 53%, Asia and Middle East at about 17%, the EU at about 16% and 14% to the rest of the world including North America and South America. The exports growth areas in 2025 were the UK at 21%, BRIC+ countries at 31%, the EU at 9% and the Southern African Development Community (SADC) at 8%.

The agricultural trade surplus rose to R24,6 billion in the fourth quarter, underscoring the sector's positive contribution to South Africa's balance of payments when compared to the surplus of about R20 billion recorded during 2024.



This achievement stems from government support to export-oriented horticulture which has demanded the opening of new markets, rapid deployment of precision-agriculture tools, and expanded value-chain finance rather than pure acreage growth. Our sector has also embraced modernisation which is continuing to bear fruits. Adoption of new farming methods has led to commercial farms raising yield per hectare by embracing satellite-guided fertilisation, drone-based pest scouting, and soil-moisture sensors embedded in variable-rate irrigation rigs, reducing water utilisation by 18% to 25%.

The department's policy support in terms of the Agriculture and Agro-processing Master Plan (AAMP) has unlocked R1,2 billion from the public and private financial institutions for irrigation upgrades and packhouse expansion, resulting in a 15% reduction in post-harvest losses since 2024. Significant agricultural exports in 2025 highlighted the sector's dual role as a generator of foreign exchange and a cornerstone of domestic food security, and about 950 000 jobs. Primary agriculture contributed about 2,8% of the GDP, but its value chain's contribution was about 14% of the R7,34 trillion of the GDP during 2024.

The strongest-performing export categories during 2025 included table grapes, maize, berries, wine, citrus, apples and pears, sugar, nuts, fruit juices, wool, apricots, cherries, and peaches. Notably, fruits and nuts alone accounted for 26% of total agricultural exports in this quarter.

Minister Steenhuisen said that this momentum provides a platform for further market expansion.

"Good progress has recently been made in expanding international market access for South African agricultural products. This includes newly secured market access for South African stone fruit into China, as well as the first shipment of South African table grapes to the Philippines, which is currently en route. These developments will go a long way in further increasing the value of the sector's contribution to South Africa's exports."

"We also gained market access for table grapes to the Republic of Korea during January

2026 and our first shipment will head there for the first time in the 2026/2027 season, and we are also speeding up the conclusion of market access negotiations with the Philippines for apples and pears and their experts will be undertaking verification to South Africa during the last week of March 2026. I will be visiting the Philippines during July 2026 to ensure the finalisation and publication of the export protocol."

The minister said that opening new markets is central to insulating the sector from geopolitical risk and trade volatility.

"Agriculture cannot be overexposed to any single trading partner. Our strategy is clear: broaden market access, deepen relationships across Africa, Asia and the Middle East, and secure new protocols that unlock value for producers."

The fourth-quarter performance also coincides with encouraging domestic employment figures. According to Statistics South Africa's latest Quarterly Labour Force Survey, agriculture added 30 000 jobs in the final quarter of 2025, bringing total sector employment to approximately 950 000 people. The sector recorded a robust 3,3% quarterly growth rate which places it amongst the strongest job creators in the economy.

"This is not accidental," Minister Steenhuisen said. "It reflects expanding farming operations, growing export volumes, and renewed confidence across the agricultural value chain. At a time when other sectors are shedding jobs, agriculture is creating them." The minister acknowledged that challenges remain, particularly ongoing port inefficiencies and external tariff pressures. However, he noted that improvements in network industries and logistics reform are beginning to show tangible benefits for exporters.

"Our farmers are competing in some of the most demanding markets in the world. The record performance in the fourth quarter of 2025 confirms that South African agriculture remains globally competitive, resilient, and forward-looking," Minister Steenhuisen concluded.

Agroecology Farmers Awareness Day: Putting legislation and policy into practice

JS Kau, S Walker, JJ Anderson, W Shiba, TJ Mboweni, L Maboja & M Matlou

ARC

FAO (2018) defines Agroecology as an integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of food and agricultural systems. The High-Level Panel of Experts (HLPE) of the United Nations (UN) collated 13 principles that they use to evaluate if projects are aligning with the principles of Agroecology. The agroecological principles are divided into three main groups. Those related to **environmental sustainability** include recycling, input reduction, soil and animal health, biodiversity, land, and natural resources governance, as well as synergies across all the elements of the agri-food system. The **social justice** group includes co-creation of knowledge, maintenance of social values and healthy cultural diets, together with participation of food consumers and producers in decision-making and management of the agricultural-food systems. The third group is **economic fairness** that includes economic diversification, fairness for all role-players based on fair trade, fair employment, fair treatment of all property rights, and equitable benefit sharing from agricultural activities, together with strong connectivity between consumers and producers to enhance local economies. In South Africa and around the world, the concept of Agroecology is gaining traction, yet it is frequently misunderstood. It is often mistaken for practices like regenerative agriculture, conservation agriculture, or organic farming (Garbisu et al., 2025).

Creating awareness regarding Agroecology helps clarify misconceptions and exposes farmers to business opportunities while also preserving the environment. Three objectives were set out for the farmers' day awareness event. These included creating awareness about Agroecology as a sustainable pathway to mitigate against the negative effects of climate change, to re-align Agroecology within the broader context of the ongoing food transformation pathway, encompassing Food and Nutrition, and to initiate a process towards institutionalising Agroecology in South Africa. The Agricultural Research Council (ARC) hosted the event on 16 October 2025. The event was largely dominated by exhibitions, with only one formal presentation delivered on the day. The exhibitions highlighted several farming technologies, encompassing some components of Agroecology. These included, but were not limited to, sustainable farming techniques, such as conservation and regenerative, and organic agriculture techniques. Other exhibitions were about collection and storage for indigenous seed products, bio-inputs derived from grass-roots innovation, organic fertilizer solutions, beekeeping bi-products, wetland management systems, production of biochar and biogas techniques, as well as demonstrations on rainwater harvesting and recycling of grey water. A simulated wetland system, deriving recycled grey water from showers, was presented by the ARC.

A register used to capture profiles of farmers, during the farmers' awareness day event, shows that 41% of the 174 people who attended the event are practicing organic farming, which is one of the important components of Agroecology. Although this might seem a small figure, people are starting to embrace Agroecology, amid emerging empirical evidence, as to the dangers of Conventional Agriculture. As an example, a 2022 report by the World Health Organization (WHO), Food and Agriculture Organization (FAO), UN, and Organization for Animal Health (OAH) criticises Conventional Agriculture for several social ills. These include unintentional poisoning caused by excessive application of pesticides which results in pollution of water, air, and soil. In 2015, these factors were responsible for 400,000 human deaths across the world (FAO, UN, WHO, and OAH, 2022).

According to the FAO (2025) report, the annual cost of land degradation, including that caused by excessive use of synthetic fertilizer, is estimated at USD 300 billion. Across the world, as of 2024, 1.7 billion people were living in land-degraded areas with significant crop yield losses (FAO, 2025). The emerging environmental risks associated with CA have now reignited a re-think to Agricultural development, with focus now levelled at sustainable production practices.

Highlights from the main presentation delivered at the event

Prof Raymond Auerbach presented Agroecology as the future for sustainable food systems, with global organic farming shown to have expanded from 15 million hectares in 2000 to 96 million hectares in 2022. The presentation highlighted Africa's growing engagement through the African Union's ecological organic agriculture typology and stressed the transition from chemical monocultures to integrated, organic, and biodynamic systems. South African Organic Sector Organisation (SAOSO) was cited in the presentation as a significant role player when it comes to coordination for activities around organic farming and, consequently, Agroecology. SAOSO is said to have developed national organic standards and promotes Participatory Guarantee Systems to support smallholder farmers. The presentation aligned agroecology with African food sovereignty principles, advocating for localized food systems, farmer empowerment, and biodiversity. Ultimately, agroecology is framed as an integrated approach that integrates science, policy, and community action to achieve climate resilience and inclusive rural development (Auerbach, 2025). Statistics for soil degradation caused by Conventional Agriculture were provided. In South Africa, deliberations and investments



Small-scale farmers and other stakeholders attending an Agroecology information day at ARC-VIMP.

into Agroecology draw impetus from a host of environmental legislations and this is discussed in the next section.

Policy and legislation as enabling parameters for promotion of Agroecology

The important legislations in South Africa, supporting Agroecology, include but not limited to, the Constitution for the Republic of South Africa Act No. 108 of 1996, Preservation and Development of Agricultural Land Act (PDALA) 39 of 2024, National Environmental Management Act no 10 of 2004, National Environmental Management Protected Areas Act (NEMPAA) 57 of 2003, National Environmental Management Biodiversity Act (NEMBA) 10 of 2004, Conservation of Agricultural Resources Act (CARA) 43 of 1983, and Agricultural Product Standard Amendment Act (APSAA) No. 63 of 1998.

The constitution makes important stipulations when it comes to food and social security welfare needs of society. Chapter 27 on “health care, food, water, and social security”, stipulates that everyone has the right to sufficient water and food. Chapter 2, on the “Bill of Rights” section 24 of the Constitution, stipulates that everyone has the right to (a) “An environment that is not harmful to their health or well-being”, (b) “have an environment protected, for the benefit of present and future generations. The **NEMA** provides protection and management of the environment. Chapter 7 of **NEMA**, for instance, stipulates the effect of the need for

making applications for permits if biological resources are to be moved from one area to the other. Chapter 6 speaks to issues of bioprospecting, access, and benefit-sharing between research and development practitioners and local communities and clearly states that local communities must be consulted in instances where certain natural resources are to be bio-prospected. Chapter 4 provides for the protection and preservation of threatened or protected ecosystems and species, whereas Chapter 7 stipulates the penalties to be imposed against perpetrators of environmental damage.

NEMBA provides for the management and conservation of South Africa’s biodiversity. This includes the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; equitable sharing benefits arising from bioprospecting involving indigenous biological resources. **NEMPAA**, provides for the declaration of protected areas and for the management of protected areas; acquisition of rights in or to land by the state; and the establishment of offences and issuing of penalties in instances of wrongdoing. This is an important legislation for the protection of various wetland areas, water catchment areas, mountain areas, world heritage sites, and various parks and resorts. **CARA** is a comprehensive legislation addressing management for a wide range of natural resources. It provides for the management of natural resources at national, provincial



and farm-level, including the following: the management of grazing capacity, control of invasive species and weeds, soil erosion, salinity, and water logging, pollution of water resources, restoration of degraded or damaged natural resources, among others. Several principles for Agroecology, such as recycling, resilience, biodiversity, responsible governance, efficiency, and soil health, are addressed by CARA.

PDALA addresses a host of conservation issues on land and further makes provision for the empowerment of farming communities through relevant, dedicated training. PDALB empowers the Department of Agriculture (DoA) in terms of legislative ownership of land to an extent that development practitioners, if they want to appropriate land for non-agriculture purposes (e.g., mining), must first request permission and approval from the Ministry of Agriculture. PDALA provides for the agricultural land evaluation, classification, and declaration of protected agricultural areas.

The effectiveness of these pieces of legislation became apparent at the time of securing a geographic indicator status for the organic Karoo lamb. Where application for a combination of these legislations, including the Agricultural Product Standard Amendment Act, saw Karoo lamb become a premium brand in international markets. Today, this product, which is produced under Agroecological conditions, generates millions of Rands in international markets (Muguti, 2023).

Using legislation, several unencumbered indigenous commodities, e.g., Mopani worms, which are traded in informal markets, and generating millions of Rands, with farmer awareness campaigns currently driven by the ARC, could also secure GI status in the future. So, other than implementing its mandate, as enshrined in the Agricultural Research Act 86 of 1990, the ARC is empowered by a host of favourable legislation to promote Agroecology, as a long-term sustainable strategy to mitigate against the negative effects of climate change.

Enquiries: Dr Joseph Kau (kauj@arc.agric.za)



Holding Africa's Water 30 Countries and Counting



MINING



AGRICULTURE



INDUSTRY



FOOD & BEVERAGE



MUNICIPAL



FIRE FIGHTING

- High corrosion resistance
- Cost effective
- On-site assembly
- Tough and durable
- Low maintenance
- 5kL to 4000kL
- Steel-domed roofs or open-top tanks
- Human consumption/ food grade certified
- Tanks < 350kL require no concrete foundation

www.rainbowtanks.co.za

sales@rainbowres.com

+27 (0) 11 965 6016



Underutilized indigenous crops:

Lessons from Mkolorha Village in Mbizana

Ayabonga Toko, Dr Anele Mayekiso, Professor Michael Aliber
University of Fort Hare,
Department of Agricultural Economics, Extension and Agribusiness

In many rural communities across South Africa, fields and home gardens hold crops that have sustained families for generations. Yet many of these crops remain overlooked in modern agricultural systems. A recent field visit to Mkolorha village in Mbizana, under the Winnie Madikizela-Mandela Local Municipality in the Eastern Cape, bore both the resilience and the untapped potential of these underutilized indigenous crops (UICs). The visit formed part of ongoing research on how UICs can contribute to sustainable and climate-resilient food systems. These crops are naturally adapted to local conditions and often require fewer external inputs such as fertilizers, irrigation, or pesticides. As climate change increasingly threatens agricultural productivity, the value of such crops is becoming more evident.

During the visit, conversations with household heads who cultivate these crops in their home gardens highlighted how indigenous crops remain deeply embedded in rural livelihoods. Many households continue to cultivate crops such as Taro (*Amadumbe*), sweet potato (*Ubhatata*), and several indigenous fruit trees. Amadumbe, commonly known as Taro, is particularly important in the area, as households claim that it is one of the crops they grew up eating. This root crop is valued

for its nutritional benefits and its ability to grow well in most soils, making it suitable for many parts of the Eastern Cape. Alongside Taro, households also grow sweet potatoes, another resilient crop that provides for both food and income. In addition, many homesteads maintain indigenous fruit trees such as the Natal wild banana (*Isikhamanga*) and Indyomi. These trees not only provide fruit but also carry cultural and ecological significance within the community. For many households, these indigenous crops and trees serve as both a food security buffer and a small but important source of income.

Normally, families harvest *Amadumbe* and *Ubhatata* and sell them locally when buyers become available, suggesting that sales are largely seasonal and dependent on limited local market opportunities. However, the process of selling these crops reveals one of the key challenges facing indigenous crops: the absence of structured markets. During interviews with farming households growing indigenous crops in Mkolorha village, participants mentioned that *Amadumbe* is commonly sold to unknown middlemen who arrive in the village to purchase the produce. These buyers typically set the date and time for their visit, and request specific quantities, often measured in 20-litre containers. Farmers



Isikhamanga Fruit

reported that each 20-litre container of *Amadumbe* is sold for approximately R150.

At first glance, this may seem like a reasonable transaction. However, the arrangement raises several concerns. Farmers often do not know who the buyers are, where the produce is ultimately sold, or how the prices are determined. The middlemen simply arrive, collect the produce, and leave. This informal trading structure limits farmers' bargaining power and reduces their ability to benefit fully from their labour. Such practices highlight a common problem in the value chains of underutilized indigenous crops, particularly missing or weak market linkages. Without organized supply chains, storage facilities, processing opportunities, or direct access to markets, farmers remain dependent on such buyers. This means that although these crops have clear economic potential, the communities producing them often capture only a small share of the final value.

Another striking observation from the field visit was the farmers' experience with extreme weather conditions. At the time of



Isikhamanga Tree

the interviews, several farming households mentioned that the village had recently experienced a severe storm that washed away many crops in their fields. Heavy rainfall and strong winds had caused significant damage, particularly to maize fields, which many farmers rely on as a staple crop. However, farmers pointed out an important difference when it came to UICs. While the maize had been severely affected and, in some cases, destroyed, crops such as *Amadumbe* and *Ubhatata* were able to recover much quicker after the storm. Farmers explained that even after the soil disturbance, these crops continued growing and began regenerating within a short period. This experience provided a practical demonstration of the resilience of indigenous crops to harsh climatic conditions. UICs appear to possess natural characteristics that allow them to withstand and recover from environmental stress. For rural communities increasingly exposed to climate variability, this resilience is not just theoretical; it is something they observe directly in their fields.

The experience in Mkolorha village serves as a reminder that solutions to food insecurity and climate challenges may already exist within local communities. The experience further demonstrates the remarkable resilience of rural food systems. That is, regardless of limited market access and climate-related challenges, farmers continue to cultivate these crops because they understand their value. *Amadumbe*, for example, is not only a source of income but also food that supports the household's nutrition. Indigenous fruits such as *Indyomi* provide seasonal nourishment, while crops like *Ubhatata* contribute both to dietary diversity and food security. Indigenous crops represent a wealth of knowledge, resilience, and opportunity. What is needed now is greater investment in research, market development, and policy support to bring these crops from the margins into the mainstream.

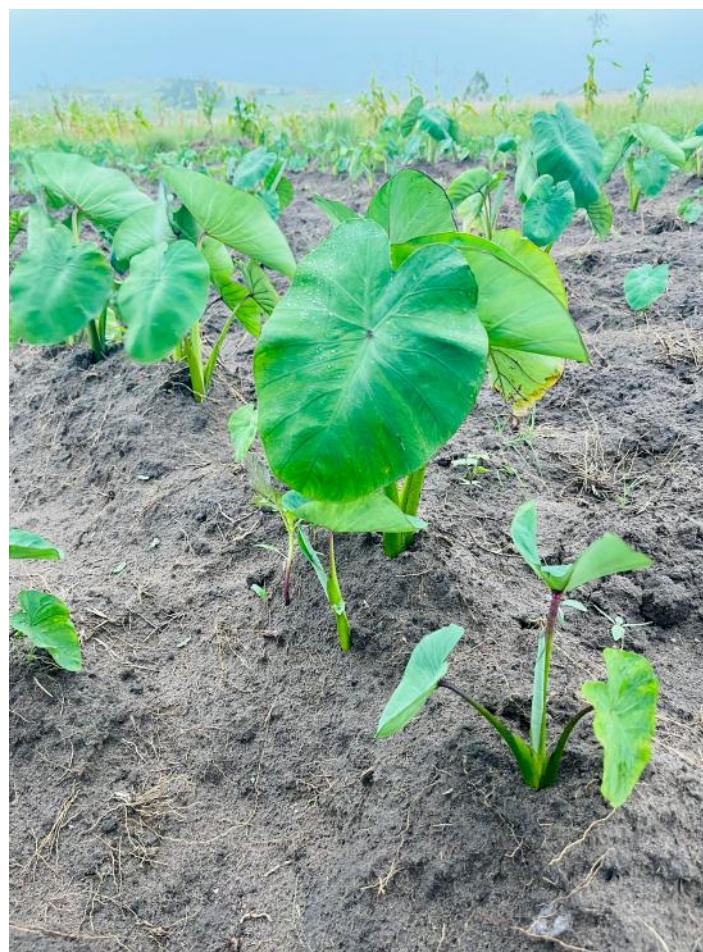
There is a growing recognition that crops like these could play a much larger role in South Africa's agricultural and food systems' future. However, unlocking their full potential requires

more than just encouraging farmers to grow them. It requires strengthening the entire value chain, from production to processing, marketing, and consumption. Farmers need better access to information, organized markets, and fair pricing systems. Cooperative marketing structures, improved storage, and value-addition initiatives could significantly increase the income generated from these crops. For example, *Amadumbe* could be processed into flour or other products that can be sold in urban markets. Indigenous fruits could be used in juices, jams, or dried fruit products. Such innovations would not only create new income opportunities but also increase consumer awareness of these nutritious and culturally important foods.

As South Africa looks toward building more sustainable and climate-resilient food systems, communities like Mkolorha offer valuable lessons. Through supporting farmers who cultivate underutilized indigenous crops, the country can strengthen rural livelihoods, preserve cultural heritage, and build a more diverse and resilient agricultural future.



Imithwane

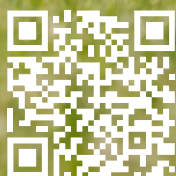


Taro

HUSQVARNA TS 114 GARDEN TRACTOR

Some machines *just keep going*

Cover more ground with the Husqvarna TS 114 garden tractor. Designed for large lawns, it features a spring-assisted 95cm cutting deck, adjustable heights, ergonomic controls, and side-by-side pedals for comfortable, precise operation. Compact enough for narrow passages, easy to store and maintain, and fitted with a towing hook, it is a versatile, reliable machine engineered for effortless use.



Scan the QR code to locate
your nearest Husqvarna dealer.

www.husqvarna.com/za
#WeAreHusqvarna

Boosting Dry Anaerobic Digestion with Size-Reduced Biochar

Dr Ashira Roopnarain and Dr Haripriya Rama
ARC-Natural Resources and Engineering

Every year, millions of tons of agricultural and food waste are generated globally. Crop residues such as stalks and husks as well as food waste and other organic by-products are often burned, dumped in landfills, or just left to rot, releasing copious amounts of greenhouse gases into the atmosphere. However, these materials are rich in stored energy that can be converted into a valuable renewable energy source, biogas. Biogas is a green fuel with several applications including cooking, heating, and even electricity generation. Biogas is generated during the process of anaerobic digestion, where microorganisms break down organic waste such as food and agricultural waste in the absence of oxygen. A more water efficient version of conventional anaerobic digestion is dry anaerobic digestion (DAD), which relies on high-solid waste containing more than 20% total solids and limited water, making it ideal for water-scarce regions.

Problems associated with dry anaerobic digestion

While DAD is water-wise, it is more challenging than conventional anaerobic digestion. High-solid systems have the tendency to become chemically and biologically unstable. Limited water results in the slower breakdown of organic material. In addition, acids known as volatile fatty acids (VFAs) that are produced during the DAD process tend to build up. When these acids accumulate, they lower the

pH of the DAD system, creating conditions that are hostile to the methane-producing microbes. If these microbes are stressed or die off, methane production drops, and the digester can even fail altogether. This instability is one of the main reasons why DAD systems are not yet widely adopted, despite its multitude of advantages.

A small material with massive potential

To solve these problems and make DAD more feasible, scientists are turning to an unusual helper: biochar in the micro and nano size range. Biochar is a carbon-rich material that is

made by heating organic biomass in an oxygen free environment. When it is engineered to a much smaller size, it develops a highly porous structure with an enormous surface area.

This tiny material can serve as a microbial support system or microbial carrier. Its multitude of pores provide safe spaces where microbes can attach and grow, forming stable microbial

communities. This small biochar can also adsorb toxic compounds that are otherwise known inhibitors to microbial activity. In addition, it creates microenvironments that buffer sudden changes in acidity, helping to keep conditions stable inside the digester. Perhaps most importantly, small biochar may even help microbes interact with each other more efficiently thereby boosting methane production.



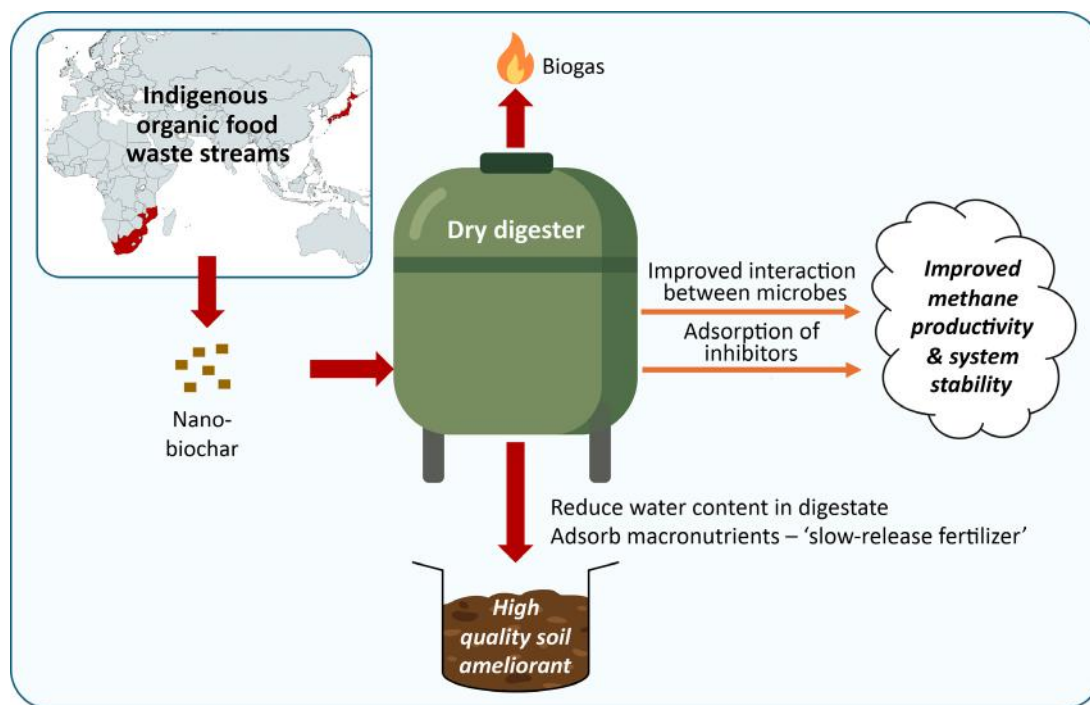


Figure 1: Overview of W3M-Dry AD project

The W3M-Dry AD project

The potential of small biochar on DAD is the basis of the initiation of the W3M-Dry AD project: “Water wise waste management: Two ends of the size scale, macro and nano augmentation for dry anaerobic digestion optimisation”. One of the key focus areas of the project is to explore whether small biochar can act as a microbial modulator thereby shaping and stabilising the microbial community inside dry anaerobic digesters and improving the overall process and biogas yield.

The team hypothesises that adding small biochar will not only increase methane production but also make the system more resilient to stress and prevent process failure. To test this, we are running controlled laboratory experiments using high-solid agricultural residues as substrates for DAD in the presence and absence of different small biochar types. By measuring biogas production, acid levels, and pH, and by sequencing microbial DNA, the researchers will track how biochar influences system performance, microbiome dynamics and overall biogas productivity.

Why does this matter for the real world?

More stable and efficient DAD systems could be transformative, especially in regions experiencing water scarcity and limited energy access. Farmers and communities could turn

organic waste such as crop residues into fuel, reduce waste disposal costs, and lower greenhouse gas emissions, all at the same time.

Beyond energy, this research also supports the idea of a circular bioeconomy, where waste is no longer discarded but reused as a valuable resource. By understanding how biochar interacts with microbial communities, scientists can design smarter, more resilient technologies that work with nature rather than against it. By combining materials science, microbiology, and renewable energy research, this work shows that even the smallest materials can have a massive impact.

This research forms part of the W3M-Dry AD project, a collaboration between South Africa, Mozambique, and Japan. It reflects a growing international push toward sustainable, low-water, low-carbon technologies that can meet the needs of both people and the planet. The SA project team is funded by the National Research Foundation (NRF) with team members affiliated to the Agricultural Research Council (ARC), University of South Africa (UNISA) and University of Venda (UNIVEN).

For inquiries and comments:

Dr Ashira Roopnarain RoopnarainA@arc.agric.za
Dr Haripriya Rama RamaH@arc.agric.za

The Role of Small Millers in Rural Vhembe District, Limpopo

Livhuwani Masola.
Agricultural Research Council

Maize is a staple food for millions of South Africans and a foundation of rural food security. While large agribusinesses dominate commercial maize milling, smallscale millers remain essential to everyday life in many rural communities. In districts such as Vhembe in Limpopo, these millers provide affordable, accessible services that allow households to process their own maize into meal while retaining value within the local economy. Beyond cost savings, small millers support traditional farming practices and cultural food preferences. Despite their importance, they receive limited policy attention, even as national strategies such as the Agriculture and AgroProcessing Master Plan call for more inclusive rural development.

Local Milling at the Heart of Rural Food Systems

According to Grain SA (2023), an average South African consumes about 81 kg of white maize meal per year, yet maize meal prices remain highly volatile. The maize milling industry is dominated by large agribusinesses such as Tiger Brands, RCL Foods, and Premier Foods, which mainly supply supermarkets with refined and fortified maize meal.

While this system serves urban and formal markets, it often overlooks the critical role

played by smallscale millers, especially in rural areas. The Agriculture and AgroProcessing Master Plan (AAMP) recognises this gap and calls for the expansion of local processing capacity to strengthen rural economies by 2030.

For many households in the Vhembe District, growing maize is both a cultural practice and an essential buffer against poverty. Small millers enable families to process their own maize into meal, typically measured in 20litre buckets, allowing them to mill only what they need while storing the rest of their harvest as grain for future use. Small milling facilities usually operate on designated days, such as Wednesdays and Fridays, and are located within walking distance of most villages. Where distances are greater, mill owners often provide transport, collecting customers early in the morning and returning them later in the day. This accessibility makes small millers deeply embedded in village life.

Economic Lifeline for Smallholder Farmers

Smallscale milling provides a vital and affordable option for rural households. A smallholder farmer in Vhembe typically pays about R120 to mill a 50 kg bag of their own maize. In contrast, a 50 kg bag of maize meal purchased from a supermarket can cost



Figure 1: A maize milling facility in a rural village in the Vhembe District

around R620. This difference means a saving of nearly R500 per bag, money that remains within the local economy. These savings are often used to buy seeds, fertilisers, school supplies, or meet other household needs. In this way, small millers play a crucial role in reinforcing household resilience and supporting local economic circulation.

Preserving Traditional Farming Systems and Culture

Beyond economics, small millers help sustain traditional agricultural practices. Their willingness to process small, mixed batches of maize allows farmers to continue growing traditional and heirloom varieties, unlike large industrial mills that require uniform, genetically modified grain. This locally milled maize meal is preferred by many older consumers for its natural taste and absence of additives or fortification. For rural families,

it represents more than food it carries cultural identity, memory, and a sense of home.

Conclusion: Investing Where It Matters Most

Supporting smallscale millers is not merely a matter of convenience; it is a strategic investment in rural livelihoods, food security, and local economic development. To realise the goals of the AAMP, government support must go beyond policy statements to include targeted grants, infrastructure investment, skills development, and the promotion of cooperative relationships between smallholders and millers.

By strengthening local milling systems, South Africa can ensure that value remains in rural communities, traditional crops are preserved, and smallholder farmers gain fair and sustainable access to markets.

Foot And Mouth Disease

Update: Western Cape

The Provincial Foot-and-Mouth Disease Joint Operational Centre (JOC) met today to address the latest developments regarding Foot-and-Mouth Disease (FMD) in the Western Cape. During the meeting, the Department of Agriculture's Veterinary Services provided feedback on the current situation, vaccination progress, and operational measures that have been implemented.

To date, 25 cases of FMD have been reported, of which 12 have been confirmed. In response, an extensive vaccination programme is underway. Thus far, 337 farms have been vaccinated, particularly in areas where commercial farming borders informal farming operations.

The province's identified hotspot areas are the Mossel Bay area, Cape Metro, Drakenstein, and Swartland Municipality. A total of 75,203 animals in these areas has been vaccinated so

far. A farm is only reported as vaccinated once the entire farm has been completed.

The province received 100,000 vaccine doses last week, which were distributed to the relevant areas within a day. In total, the Western Cape has received 170,400 vaccine doses. However, there remains concern within the industry that vaccines may run out before all dairy farms have been vaccinated.

Twenty-nine private veterinarians are currently assisting state veterinarians with the vaccination process. These veterinarians are focusing particularly on dairy farms in the Garden Route/Mossel Bay area and around Malmesbury. Producers can apply and appoint a private veterinarian to assist with the process.

Provincial traffic authorities have also confirmed that 19 checkpoints across the Western Cape are currently operational to monitor the movement of animals.





Movement of animals

Animals that have been vaccinated must observe a waiting period of approximately 28 days to allow the vaccine to become effective in their systems before movement can be considered. If animals need to be moved, the necessary documentation is mandatory. A state veterinarian will decide, after inspection, what action may be permitted. Animals that are vaccinated as a preventative measure are not necessarily placed under quarantine.

Abattoirs

Inspections have already been conducted at abattoirs, but no new registrations have yet been confirmed. Animals presented for slaughter must show no clinical signs of FMD.

Feedback from regions

Cape Metro: Vaccinations are ongoing in areas such as Makaza and around Kalbaskraal. Checkpoints within the municipality are staffed 24/7 by Metro Police. Information sessions are also being arranged to strengthen awareness and knowledge about FMD.

Garden Route (Mossel Bay): Another farm within the quarantine area has tested positive. The farm has already been vaccinated. All checkpoints remain in place.

FMD-free areas: The Overberg and Central Karoo currently remain FMD-free. Producers in these areas are encouraged to continue applying strict biosecurity measures. In the Overberg, the situation is being closely monitored following a possible case in Bonnievale, where clinical signs were reported over the weekend. Some animals on the affected farm have already been vaccinated.

Law enforcement and traffic

The South African Police Service confirmed that visible policing continues and that cooperation between stakeholders is functioning well. Provincial traffic authorities indicated that more than 15,000 vehicles have been stopped at checkpoints. Of these vehicles, 44 were transporting animals, all of which were inspected. All livestock transporters are also being monitored at the eight weighbridges in the Western Cape.

Producers are encouraged to immediately report any suspicious clinical signs to their local veterinarian or the department, and to maintain strict biosecurity measures on their farms.

Making Craft-Style Tomato Chutney

Theresa Siebert
ARC-Natural Resources And Engineering

Chutney is a sweet, tangy condiment that is served with curries, hot and cold meats, and savouries. Tomato chutney may be prepared from both green and ripe tomatoes, along with onion, sugar, vinegar, and various other ingredients, including spices. It is packaged in glass bottles and has a shelf-life of several months under cool storage conditions.

Ingredient selection for tomato chutney:

Green tomatoes: The tomatoes are picked at full size, just prior to turning colour. The fruit should be free from rot and disease. Minor blemishes can be tolerated as these are easily trimmed away.

Ripe tomatoes: The tomatoes are picked in the firm-ripe stage. Selective hand picking enables the fruit to be sorted in the field. Any sunburnt, overripe, and infected tomatoes are discarded.

Other ingredients: Peeled, chopped onions, brown sugar and vinegar are the basic ingredients of any chutney. Peeled, chopped apples (preferably Granny Smith) and sultanas are popular additions to tomato chutney. A wide selection of spices may also be used. Green tomato chutney favours the additions of mustard, cinnamon, cloves, cayenne pepper, chillies, and garlic. Ripe tomato chutney blends well with allspice,

curry powder, garlic, chilli powder, cinnamon, ginger, and cloves.

1. Washing the tomatoes:

Washing is only necessary in cases where the fruit is heavily soiled or if it has been sprayed with chemical pesticides. Washing takes place in a water bath.

2. Peeling the fruit:

The tomatoes are scalded for approximately 1 minute in hot water or steam at 98-100°C. The tomatoes are then given a cold-water dip. This rapid drop in temperature helps to loosen the skin for easy peeling without loss of sub-surface tissue. The cooled tomatoes are then given a shallow slit at the blossom-end, and the peel is pulled off using a sharp knife.

Onions are topped and tailed and given a lateral slit before the outer shell is peeled off. Apples are peeled and cored by hand.

3. Chopping of fruit:

Chopping of the tomatoes and other fruit are done by hand using stainless steel knives, hand driven apparatus, or small electric food processors. The size of the fruit pieces will have a significant effect on the consistency of the product.

4. **Cooking:**

All the ingredients are combined in a large saucepan or batch cooker and slowly heated until all the sugar has dissolved. The heat is then turned up to bring the mixture to boil and left to simmer, uncovered, until the liquid starts to thicken, which usually takes about 45 minutes. The mixture should be stirred occasionally to keep the pieces from settling to the bottom of the pan and burning.

5. **Sterilisation of jars:**

The glass jars used for the preservation of the chutney should be of high quality, without any cracks or chips and should for tight seals with the lids. There are various methods of sterilising jars using either dry or moist heat.

Oven method: The clean jars are placed upright in a cold oven, allowing an even spacing between the jars. The temperature is set on 160°C and the jars are left in the oven for a minimum of 30 minutes. The hot bottles are then removed using gloves and tongs.

Boiling method: The clean jars are placed, lying down, in a deep pot and covered with cold water. The water is brought to boil. After 10 minutes of boiling, the jars are removed using tongs. The jars are placed upright on a wooden board and are ready to fill.

Steam method: Jars can be sterilised by saturating the interior with steam. This can be done by simply holding the open neck of the jar above the spout of a steam generator, water boiler or even a kettle, for 1 minute. Tongs or clamps are necessary to handle the hot jars.

Take note, generally, hot food goes into hot jars and cold food into cold jars. This prevents thermal shock.

6. **Filling and sealing of the jars:**

Filling involves displacing the air in the containers with a food product prior to sealing. The hot chutney is filled into the hot, sterilised jars, leaving virtually no room on top. This is important since the hot chutney shrinks upon cooling. The filled jars are left to cool before they are sealed with suitable, tight-fitting lids. Metal lids are generally not suitable since the high acid content would cause corrosion of the metal, leaving the product inedible. Specially lined or lacquered lids are required.

7. **Storage:**

The chutney is stored in a cool, airy, dark place. Once the seal has been broken, it requires refrigerated storage.

Inquiries: SiebertT@arc.agric.za



Butter Roasted Flattie with Roasted Shallots

Ina Paarman

A round iron skillet is one of the most versatile kitchen tools. Here's how you can roast a whole butterflied chicken in this pan, using only butter, chicken spice, and a splash of oil. Succulently tender and flavourful, like great chicken should taste!

Serves: 4

You Will Need:

- 1 whole chicken (± 1,4 kg), backbone removed and butterflied
- 1 T (15 ml) Ina Paarman's Chicken Spice
- 2 T (30 ml) oil
- 4 T (60 g) butter

Roasted Shallots

- 500 g shallots
- 2 sachets Ina Paarman's Steakhouse Pepper Flavour Bomb
- 2 T (30 ml) oil



Method:

Place the empty pan in the oven whilst preheating the oven to 220 °C for 20 minutes.

Season the butterflied chicken all over with Chicken Spice.

Remove the pan from the oven (be sure to use well-insulated oven gloves for handling the hot pan) and swivel the oil in the pan.

Place the seasoned chicken, skin side down, in the hot pan.

Return the pan to the oven to roast the chicken for 5 minutes.

Now dot the butter around the chicken in the pan, and roast for a further 25 minutes.

Remove the pan from the oven, carefully turn the chicken over, and baste it all over with the buttery pan juices.

Return the pan to the oven, turning down the temperature to 200 °C, for another 15 - 20 minutes.

While chicken is in the oven start prepping the shallots.

Peel and halve the shallots, and place in a mixing bowl. In a small bowl mix the Flavour Bomb and oil then pour over the shallots. Toss to coat. Transfer to a baking sheet lined with baking paper, then roast for 20 - 25 minutes at 200 °C until tender and caramelised.

Remove the chicken from the oven and leave to rest for 10 minutes in the pan before serving warm or at room temperature.



FLAVOUR BOMB

Alles-in-een gekonsentreerde
geurbom wat lekker kook
maklik maak.



Al ons resepte is aanlyn beskikbaar by www.inapaarmans.co.za



Spicy Savoury Rice

Ina Paarman

The ultimate accompaniment to grilled seafood or spicy grilled meat, but equally good as a standalone vegetarian dish.

Serves: 4 - 6 as a side dish

You Will Need:

- 1 cup (250 ml) white rice, uncooked
- 3 T (45 ml) butter
- ½ green pepper, chopped
- 1 onion, chopped
- 2 carrots, sliced into rings
- 125 g mushrooms, chopped
- 1 celery stalk, chopped
- 2 - 3 x sachets Ina Paarman's Spicy Cajun Flavour Bomb
- ½ lemon
- handful coriander or parsley leaves, roughly chopped (optional)

Ina's Tip

Use an extra Flavour Bomb, if you want a stronger flavour.

Method:

Cook the rice according to the package instructions and set aside.

Heat a large frying pan and add the butter.

When melted, add all the vegetables, and cook until soft and lightly browned.

Add the Flavour Bomb sachets and cook for 2 minutes while stirring.

Add the cooked rice and mix well.

Remove the dish from the heat, season with the lemon juice, and garnish it with chopped coriander or parsley.



FLAVOUR BOMB

Alles-in-een gekonsentreerde
geurbom wat lekker kook
maklik maak.



**NUUT
UIT ONS
KOMBUIS**



Al ons resepte is aanlyn beskikbaar by www.inapaarman.co.za



SERVICE EXCELLENCE

At BKB we value the importance of trust. Trusting that the rains will return and that the land will produce for those who nurture it. Knowing that trust cannot be bought, but rather earned over time through our actions and our commitment to you, through the good times and bad. We take pride in the relationships we have built with generations of clients, each underpinned by integrity and bound through a look in the eye and the shake of a hand.

WWW.BKB.CO.ZA



The Trusted Home of Agriculture
Die Betroubare Tuiste van Landbou



To scan, download
a free QR Code app

#SustainabilitySynergised

PEOPLE | PLANET | PROFIT

SERVICE EXCELLENCE | ENTREPRENEURSHIP | EARNINGS | EMPLOYEES | SUSTAINABILITY

#IntegrityIntegrated